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ANTIHISTAMINIC DRUGS IN TREATMENT OF NONHEMOLYTIC TRANSFUSION REACTIONS

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With the introduction of the blood bank in this country in 1937,[1] the administrative responsibilities of blood replacement in patients have become centralized and organized. Placing the onus of adequate cross matching in the hands of a few has reduced the technical hazards of transfusion almost to an irreducible minimum. The value of transfusion therapy has been accorded increasing recognition through these years, being established without doubt by the experiences of World War II. Today it is recognized universally that no satisfactory substitute exists for blood when the need for it is indicated in a patient. Although the indications and necessity for blood transfusions are well established, hazards associated with its use are existent that may loom large enough in the minds of some physicians to cause hesitation in recommending it prophylactically or even at critical moments. The more common dangers or complications are (1) hemolytic transfusion reactions, (2) homologous serum jaundice, (3) circulatory overload, (4) allergic and anaphylactic reactions, and (5) "pyrogenic" reactions.

It is the purpose of this report to examine further the value of antihistaminic drugs in reducing the incidence of allergic and pyrogenic transfusion reactions. All types of reactions that occurred over a one year period in this institution will be reviewed, although it is realized that antihistaminic drugs could be expected to have little value in hemolytic reactions or in patients with circulatory overload. In order to trace the therapeutic rationale for using such drugs, some of the etiological factors relating to pyrogenic and allergic reactions will be reviewed.

TYPES OF REACTIONS

Hemolytic transfusion reactions are feared the most because up to 50% of them may cause death of the patient due to complete renal shutdown. With the recent increased knowledge concerning blood groups and with the improved, elaborate system of cross checking existent in the modern blood bank, it should be rare for incompatibilities to be overlooked in the laboratory. When incompatible blood is administered to a recipient, it is usually the result of a technical error by the blood bank staff or the physician beginning the infusion. Such errors probably will continue "so long as it is necessary for the fallible human to handle, record, read bottle labels and distinguish between recipients with similar names." [2] Provision of a working environment that allows maximum concentration on the subject in hand will tend to reduce such human errors. It is estimated that from one to five reactions per 1,000 transfusions are due to the inadvertent administration of incompatible blood.[3] This estimate will vary from one clinic to another.

The problem of homologous serum jaundice following infusions of pooled plasma became so serious during World War II that this therapy is no longer recommended in patients unless in dire emergency when no other plasma expander is available. Within the last few years the development of homologous serum hepatitis, presumably from a virus transferred passively, has also become a problem after blood transfusion. Although the possibility of transfer with multiple transfusions is greater than with single units, the mathematical incidence in both situations should be less than with pooled plasma. Ginzburg and Sussman [3] report 11 cases of viral hepatitis in 1,600 blood transfusions. The incubation period varied from 30 to 150 days. In a two year period at the Henry Ford Hospital, Detroit, in which 8,000 transfusions were given, jaundice occurred in an average of one in every 440 transfusions.[4] At present no means exist of preventing this complication, except perhaps to screen all donors as carefully as possible.

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The tripelennamine (Pyribenzamine) used in this study was supplied by Ciba Pharmaceutical Products, Summit, N. J.

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Circulatory hazards associated with blood transfusions are related more to the total volume given than to the inherent properties of the blood itself or its associated contamination. In surgical procedures, where large amounts of lung tissue are excised or where cardiac reserve is limited, it is not difficult to overload the capacity of the cardiopulmonary system. Too enthusiastic blood replacement may lead to pulmonary edema or circulatory failure. The term, "speed shock" has occurred in the literature since the demonstration by Hirshfeld and others [5] in 1931 that the rapid injection intravenously of almost any substance in an animal may lead to a marked fall in blood pressure, respiratory distress, and sometimes death. These authors believe that such symptoms are due to the release from liver cells of a substance that is histamine-like in character. Wiener [6] suggests that many of the so-called instances of allergic shock following transfusion are really examples of "speed shock." However, abundant experience with rapid transfusion therapy in the military forces has led to the belief that this syndrome has been overemphasized in the human being.

Allergic and anaphylactic reactions to blood transfusion have been described for many years. The Mayo Clinic [7] notes their incidence to be about 2.2% of the total number of bottles of blood given each year. As a rule, these reactions are regarded as sufficiently serious to stop the administration of blood. In some instances they may endanger the life of the patient from the severe shock that is associated with the reaction. [8] Within recent years the use of antihistaminic drugs has been recommended to prevent reactions of this type.[9]

Probably the most frequent type of reaction to transfusions is that called "pyrogenic." At the Mayo Clinic [7] the incidence per total number of bottles of blood given is 2.6%. Although the "pyrogenic" reaction is the least noxious as far as the patient is concerned, it may cause subjective discomfort and apprehension, and give cause for alarm in the seriously ill patient. Recent reports indicate that antihistaminic drugs may reduce the frequency of such reactions.

Pyrogenic Reactions.—In pharmacological circles the term "pyrogen" now is limited and specialized to mean substances derived from bacteria. These substances are believed to be nonpathogenic bacterial polysaccharides of high molecular weight. Many chemicals and materials pertinent to blood transfusion therapy may be contaminated by pyrogens. Included in this group are sodium citrate, dextrose, glassware, rubber tubing, needles, and syringes.[10] In spite of elaborate precautions, pyrogenic syndromes exemplified by chills, fever, headache, and feelings of oppression and apprehension, continue to occur even in the best-regulated blood banks. A factor to be explained is the latency that may exist before the onset of the rise in temperature. This delay may be due to the fact that the pyrogen per se is not an active material but is metabolized in the body before it produces a typical reaction.[9c] It is within the realm of possibility that antihistaminic drugs could block such metabolism and thus prevent the anticipated febrile response. It is also possible that the pyrogenic responses associated with blood transfusions may be due in part to passive transfer of protein substances in the blood of the donor,[11] whose febrile-producing effect in the recipient may be prevented by antihistaminic drugs. In other words, one may hypothesize that pyrogenic reactions may be due to contaminant bacterial "pyrogens" or to unknown materials transferred passively in the blood of the donor. These latter may be in the nature of "allergic" substances.

Allergy and Anaphylaxis.—Allergy may be defined as a condition of unusual or exaggerated specific susceptibility to a substance that is harmless in similar amounts for the majority of recipients. Anaphylaxis is a somewhat more specific term, denoting a state of allergy to a foreign protein. Both types of reactions are associated with blood transfusions and are believed to result from the passive transfer of substances via the donor's blood. Allergic reactions are recognized usually by the appearance of a rash, urticarial wheals, swelling of the mucous membranes, an itching sensation, and at times nausea and vomiting. A febrile response occasionally accompanies these signs and symptoms. Anaphylactic reactions are suspected with occurrence of the "shock" syndrome and a feeling of great apprehension by the patient.

It is established that allergic and certain anaphylactic reactions are due to the release of histamine acting on receptor cells. Many such reactions can be prevented by the administration of antihistamine drugs. These drugs do not prevent the release of histamine, but block its effect on the receptor mechanism of cells involved, thus aborting reactions. There seems clear evidence to suggest that antihistaminic drugs are useful in preventing or counteracting allergic or anaphylactic reactions. There is less reason to suppose that pyrogenic reactions may be inhibited by similar pharmacological antidotes.

METHODS OF INVESTIGATION

From Jan. 18, 1953, to Jan. 8, 1954, all adults who received blood transfusions in Duke Hospital were followed carefully. Charts were kept indicating the blood group of the patient, the type of the blood received, the total amount received, and whether it was given in association with some type of anesthesia. All types of reactions were noted, and in doubtful cases one or more physicians were consulted and their opinions solicited. With almost every reaction that occurred the blood serum and urine were examined for evidence of hemolysis. Bilirubin determinations were made when indicated. When the compilation was complete, the record of each patient suspected of having a reaction was reviewed. Most of the blood given in this hospital is collected from donors

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10. Whittet, T. D.: Occurrence and Importance of Pyrogens, Symposium on Pyrogens, J. Pharm. & Pharmacol. **6**: 304-309 (May) 1954.

11. Mollison, P. L.: Blood Transfusion in Clinical Medicine, Springfield, Ill., Charles C Thomas, Publisher, 1951.

who come voluntarily at the request of patients. From time to time blood collected from Red Cross regional centers is available. Donors are not accepted who have had malaria within three years, jaundice in the previous two years, exposure to jaundice within six months, or who suffer from known allergies or severe asthma. No regulation regarding fasting of donors is enforced, as it is not believed that the absence of food reduces the incidence of reactions.[1] Blood is collected under closed methods in bottles containing acid citrate dextrose solution and glass beads. The acid citrate dextrose solution in each 500 cc. bottle consists of disodium hydrogen citrate, 2.5 gm., glucose 3.0 gm., and enough pyrogen-free distilled water to make 100 cc. The blood is stored at temperatures varying between 2 and 6 C (35.6 and 42.8 F). Pyrogen-free disposable transfusion sets equipped with metal filters are used for administration. Blood stored for periods up to 21 days is transfused. The oldest blood in the bank is utilized first unless fresh blood is required for some specific purpose.

In this series tripelennamine (Pyribenzamine) was the antihistamine preparation employed. The antihistaminic and antianaphylactic properties of this drug were demonstrated conclusively in 1945.[12] Since this time it has remained one of the most satisfactory drugs for the control of various allergic symptoms and has been associated with a minimal number of side-reactions.[13] The acute and chronic toxic effects of this drug in doses that are clinically effective have been studied carefully. Biochemical and pathological alterations have not been elicited. The toxic effects of these drugs when given in large doses have been outlined in an adequate manner.[14] The technique of administration employed in the present study was as follows: tripelennamine was supplied in sterile ampules, each containing 25 mg. of the drug in 1 cc. of solution. Just prior to the administration of the first bottle of blood to each patient, tripelennamine, 25 mg., was added to the blood under sterile conditions. The antihistaminic drug was not added to subsequent bottles of blood unless the patient received more than 12 bottles or unless there was more than a six hour interval between transfusions.

TABLE 1.—*Distribution of Patients and Total Amounts of Blood Given During Control and Investigative Periods*

Distribution	Without Tripelennamine	%	With Tripelennamine	%
Patients	1,515	100	1,616	100
Pints of blood	2,636	100	2,570	100
During operation				
Patients	658	43.4	711	43.9
Pints of blood	1,548	58.7	1,446	56.2

A series of control patients were followed at the beginning and at the end of the investigation. Those receiving tripelennamine covered the middle portion of the year. Every adult receiving blood in the hospital was included in the investigation. Children were omitted because of the difficulty in controlling proper dosage of the antihistaminic drug. In the control series a total of 1,515 patients received 2,636 pints of blood. In the investigative group 1,616 patients received a total of 2,570 bottles of blood. About 44% of the patients in each group received blood during or just following surgical operations (table 1). The reactions that occurred in each group are listed in table 2. Reactions attributable to circulatory overloading or to transfer of the virus-inducing hepatitis were not specifically noted in this study. Shock in the postoperative period associated with high hematocrit values occurred on three occasions. No instances of true "speed shock" were observed, although in many operations blood was forced into the blood stream rapidly.

RESULTS

Pyrogenic Reactions.—A patient was judged to have a pyrogenic reaction when chills developed or when an unexpected elevation of temperature of 1 C or more occurred during a transfusion or within two hours of its completion. The complaints of headache or a "chilly feeling" were believed insufficient to denote a reaction unless either shivering or fever were seen also. In the control series there were 89 "pyrogenic" reactions in 72 patients (table 3). Only five of these reactions were noted during surgery or in the recovery room during the postoperative period. Two reactions were observed during operation with the patients under spinal analgesia, two were seen in the recovery room after general anesthesia, and one was noted in the delivery room just following parturition.

TABLE 2.—*Total Transfusion Reactions Occurring During Control and Investigative Series*

Reactions	Without Tripelennamine	%	With Tripelennamine	%	
Pyrogenic	89	5.8	55	3.4	$p < 0.01$
Allergic	47	3.1	11	0.6	$p < 0.01$
Hemolytic	2	0.13	1	0.06	.....
Total	138	9.1	67	4.0	$p < 0.01$
Total to pints of blood	..	5.2	..	2.5	$p < 0.01$

In those patients receiving tripelennamine with the first bottle of blood, there were 55 reactions in 45 patients (table 3). Only two reactions occurred in relationship to surgery and anesthesia, both of these being seen during operation under spinal analgesia. The fewer number of reactions observed in the patients receiving tripelennamine is of statistical significance (p is less than 0.01).[15] Inasmuch as chills with associated increase in body temperature are two of the principal diagnostic signs associated with pyrogenic reactions, it was of interest to note

TABLE 3.—*Incidence of Pyrogenic Reactions in Relation to Patients Receiving Blood and Total Units of Blood Given*

Reactions	Without Tripelennamine	With Tripelennamine
Pyrogenic reactions	89	55
To patients, %	5.8	3.4
To pints of blood, %	3.3	2.1
Associated with operation	5	2
To patients, %	0.7	0.2
To pints of blood, %	0.3	0.1

12. Mayer, R. L.; Huttrer, C. P., and Scholz, C. R.: Antihistaminic and Antianaphylactic Activity of Some *a*-Pyridino-Ethlenediamines, Science **102**: 93-94 (July 27) 1945.

13. Loveless, M. H., and Dworin, M.: Allergy and Antihistamine Therapy, Bull. New York Acad. Med. **25**: 473-487 (Aug.) 1949.

14. Wyngaarden, J. B., and Seevers, M. H.: The Toxic Effects of Antihistaminic Drugs, J. A. M. A. **145**: 277-282 (Feb. 3) 1951.

15. Peckham, R. H.: The Determination of the Statistically Minimum Number of Cases, Am. J. M. Sc. **224**: 131-134 (Aug.) 1952.

whether the severity of the temperature reaction was different in the two series when responses did occur (table 4). The results indicate that the elevations of temperature seen with the tripelennamine group tended to be higher than in the controls.

Allergic Reactions.—The criteria for allergic reactions included the appearance, during or immediately following a transfusion, of a few or many urticarial wheals, the development of erythematous or maculopapular rashes, or the manifestation of edema about the eyes and other

TABLE 4.—*Relationship of Degree of Temperature Response in Control and Investigative Series*

	Without Tripelennamine	%	With Tripelennamine	%
Pyrogenic reactions	89	....	55	....
Temperature 40 C (104 F) or above	11	12.3	10	18.0
Temperature between 40 C (104 F) and 39 C (102.2 F)	20	21.4	27	48.8
Temperature between 39 C (102.2 F) and 38 C (101.4 F)	40	44.9	11	20.0
Others	18	20.2	7	12.7

loose areolar structures. In addition, itching sensations, fever, and occasionally severe cardiovascular reactions were seen in some patients. In the control group there were 47 allergic type reactions in 47 patients. Twenty-four of these reactions occurred during operation. In the investigative series, 11 reactions occurred in 10 patients, 6 of these being seen during surgery (table 5). The protection afforded by the antihistaminic drug against allergic-type reactions is obvious. Approximately 50% of the reactions observed occurred during or immediately following surgery.

In the group not receiving the antihistaminic drug, two severe anaphylactic-like reactions were observed. The first patient developed severe generalized erythema and urticaria associated with marked hypotension during operation under general anesthesia. Levarterenol was necessary to control the blood pressure. Because of the precarious condition of the patient, the operation was terminated rapidly. Three days later this patient received uneventfully four units of blood, with tripelennamine added to the first bottle. The second patient developed

TABLE 5.—*Incidence of Allergic Reactions in Relation to Patients Receiving Blood and Total Units of Blood Given*

Reactions	Without Tripelennamine	With Tripelennamine
Allergic reactions	47	11
To patients, %	3.1	0.6
To pints of blood, %	1.7	0.3
Associated with operation	24	6
To patients, %	3.6	0.8
To pints of blood, %	1.5	0.4

generalized erythema in the operating room while receiving a third unit of blood. Rather quickly her blood pressure became unobtainable, and she remained in a serious condition for several hours following operation. Blood serum and urine remained clear. Her condition improved gradually, and she recovered uneventfully. In the tripelennamine group, one patient developed severe generalized urticaria associated with marked hypotension while receiving a second unit of blood and while under general anesthesia. Her condition remained critical for two hours and then showed gradual improvement. Blood serum and urine remained clear. She died two days later from causes related to the surgical lesion. The majority of patients who developed allergic reactions received tripelennamine in doses of 25 or 50 mg. as a therapeutic measure. As a rule, the results with this therapy were not dramatic. Seldom was there a rapid reversal of the symptoms and signs produced. Usually the erythema or urticaria persisted for two to three hours, even though the blood had been discontinued as soon as the reaction was noted.

Hemolytic Reactions.—There were three hemolytic transfusion reactions in this study, one of which occurred in a patient who had received tripelennamine (table 6). One reaction occurred in association with anesthesia and operation. A summary of the nature of these reactions follows.

The first patient, belonging to group O, Rh positive, was being prepared for operation. Through a mistake in labeling, a transfusion of group A blood was started. The error in labeling the bottle was recognized in the blood bank a few minutes after the blood was sent to the ward, and word was sent to discontinue the transfusion. The patient received a total of 25 cc. of incompatible blood. He developed severe chills and a temperature of 39.1 C (102.4 F). His blood serum showed evidence of hemolysis, and

TABLE 6.—*Incidence of Hemolytic Reactions in Relation to Patients Receiving Blood and Total Units of Blood Given*

Reactions	Without Tripelennamine	With Tripelennamine
Hemolytic reactions	2	1
To patients, %	0.13	0.06
To pints of blood, %	0.07	0.03

the urine was a brown color and benzidine positive. The urine became normal after three hours, and the patient did not develop oliguria or other evidence of renal dysfunction. Apparently he did not receive a sufficient amount of incompatible blood to cause irreversible lesions.

The second patient, also group O, received 200 cc. of group A blood, again prior to operation. The error in this instance resulted from the presence on the same ward of two patients by the same name. The blood was correctly cross matched, but started by the intern on the wrong patient. The history number of the patient was not checked with that on the bottle of blood. In spite of the relatively large amount of blood received before the mistake was noticed, this patient developed nothing more dangerous than chills and fever. The serum showed evidence of hemolysis, and the urine was benzidine positive, but no anuria followed. Wiener indicates [6] that severe symptoms may be absent in some incompatible transfusions because the isoantibodies are of low titer.

The third patient, group O, Rh positive, was admitted to the gynecologic service with a history of severe vaginal bleeding. She was in clinical shock on admission and was given 1,000 cc. of correctly cross matched blood prior to dilatation and curettage. During the operation she received two more units of correctly cross matched blood but went into severe shock during the third bottle. Tripelennamine, 25 mg., had been placed in the first bottle of blood. All the bottles of blood were rechecked and no errors found. However, the serum showed evidence of hemolysis, and the urine was black, small in amount, and contained free hemoglobin. Anuria developed, and the patient died 10 days later, in spite of careful management of fluid and electrolyte balance, nitrogen-free fat emulsion diet, and intermittent peritoneal irrigation serving as an artificial kidney, as recently described by Grollman.[16] Although elaborate tests were

16. Grollman, A.; Turner, L. B., and McLean, J. A.: Intermittent Peritoneal Lavage in Nephrectomized Dogs and Its Application to the Human Being, A. M. A. Arch. Int. Med. **87**: 379-390 (March) 1951.

made of the patient's and donor's blood for antibodies to lesser antigenic blood groups, no incompatible antibodies were encountered in the patient's serum, both before and after transfusion. No defects were demonstrable in the blood of the donors. It is probable that anesthesia masked some of the early signs of reaction in this patient, but it is not believed that tripelennamine hid the possibility of recognition.

In only one of these reactions, the fatal one, was the element of human error not obvious. This bears testimony to the reliability of the newer cross matching techniques that have been perfected in the last few years.[2]

COMMENT

Among the statistics presented, the first remarkable item is the small number of "pyrogen" reactions occurring in association with anesthesia. The question that presents itself immediately is whether the state of narcosis prevents the development of such reactions. This we cannot answer. It is known that anesthesia will prevent or abort the shivering movements that are associated with sudden changes in body temperature. It may be that temperature reactions do occur in some patients with administration of blood under anesthesia, but these are masked and not recognized. The fact that the incidence of allergic and anaphylactic reactions under anesthesia was just as high as in patients on the wards belies the supposition that narcosis per se may protect against the development of such responses in the patient.

The protection afforded by the antihistaminic drug, tripelennamine, against allergic-type reactions is clear cut and founded on good evidence. The decrease in pyrogenic reactions noted with the prophylactic use of this drug is more difficult to explain. It is not likely to be a coincidence because of the significance of the statistical values obtained and also because similar reductions were found by other independent investigators.[9b] As noted previously, it is possible that some of the reactions labeled "pyrogenic" may in reality be "allergic" in type. It is conceivable also that the presence of an antihistaminic drug in the blood stream may block in some unknown way the expected effect of the "pyrogenic" organism to some degree. During this investigation there has been no indication that tripelennamine per se produced any deleterious effect in the patients to whom it was administered. It is not believed that it will mask a true hemolytic reaction, although there is no proof to substantiate this thought. On the basis of the known pharmacology of antihistaminic drugs, and the data presented herein, it is suggested that a drug such as tripelennamine can be used prophylactically in a safe clinical dosage to reduce to some extent the incidence of "pyrogenic" reactions, and to a marked degree the incidence of allergic and anaphylactic reactions during blood transfusion therapy. The efficacy of such a drug is less marked when it is administered therapeutically after a reaction has begun.

SUMMARY

Antihistaminic drugs afford pharmacological protection against histamine-liberating reactions. In transfusion therapy, the prophylactic administration of tripelennamine (Pyribenzamine) reduces significantly the incidence of "pyrogenic" reactions and allergic type reactions. Protection can be given in drug dosages that are considered safe clinically.

ANTIHISTAMINICS FOR ALLERGIC AND PYROGENIC TRANSFUSION REACTIONS

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During the past few years several reports have appeared that indicate that injectable antihistaminic drugs are useful for the prevention of allergic and pyrogenic blood transfusion reactions. Ferris, Alpert, and Coakley [1] reported on their experience with 607 transfusions following the addition of 25 mg. of tripelennamine (Pyribenzamine) to 500 ml. of whole blood. Compared with a control group the incidence of allergic reactions was reduced from 2.69 to 0.16%. Surprising, however, was their observation that by the same method the incidence of pyrogenic reactions was reduced from 4.31% to none. The authors concluded, by citing the lack of adequate understanding of the pathophysiology of pyrogenic reactions, that pyrogenic reactions may be a response to histamine liberation and may occur on an allergic basis. More recently Frankel and Weidner [2] suggested the use of chlorprophenpyridamine (Chlor-Trimeton) maleate for the prevention of allergic and pyrogenic reactions and stated that they had observed a reduction in incidence from 3.5 to 0.3%. Weiss [3] has reported that similar protection may be obtained by the addition of 20 mg. of methapyrilene (Histadyl) to each unit of whole blood. Work leading to similar conclusions was done by Simon

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Pyrogen MI-3 was supplied by the Merck Institute for collaborative studies on pyrogen test methods suggested by the American Drug Manufacturers Association in 1948.

1. Ferris, H. E.; Alpert, S., and Coakley, C. S.: Prevention of Allergic Transfusion Reactions: Prophylactic Use of Antihistamine in Blood to Prevent Allergic Transfusion Reactions, Am. Pract. & Digest Treat. **3**: 177 (March) 1952.

2. Frankel, D. B., and Weidner, N.: Use of Chlor-Trimeton Maleate Injectable in Blood Transfusions, Ann. Allergy **11**: 204 (March-April) 1953.

3. Weiss, S.: Management of Blood Transfusion Reactions, J. Student A. M. A. **2**: 19 (May) 1953.

and Eckman,[4] Alfonsi,[5] and Offenkrantz and co-workers.[6] Lucia [7] has reported that the addition of diphenhydramine (Benadryl) hydrochloride to whole blood retards or inhibits agglutination of mismatched blood groups and is hemolytic when added to stored blood in the concentrations they employed. The present study was designed as an effort to discover the effects of the addition of diphenhydramine hydrochloride to stored human blood.

TABLE 1.—*Free Plasma Hemoglobin Levels (Milligram per Hundred Milliliters)*

Blood No.	Before Blood Was Divided from 500 to 250 Ml. Bottles	One Week Later After Addition of: 5 Ml. of 0.9% Sodium Chloride Solution	5 Ml. of Diphenhydramine Hydrochloride (50 Mg.)
9625	35.5	35.5	30.5
9647	11.9	14.8	15.6
9690	12.7	18.6	12.4
9634	22.8	25.1	16.2
9638	19.0	20.1	17.7
Average	20.4	22.8	18.5

MATERIALS AND METHODS

The study was divided into three parts.

Part 1.—Plasma hemoglobin levels of each of five units of whole blood were determined by the method of Ham [8] and Bing and Baker.[9] The units were then split into equal amounts. To one sample was added 5 ml. of 0.9% sodium chloride solution and to the other 5 ml. of diphenhydramine hydrochloride (50 mg.). One week later the plasma hemoglobin levels for each sample were again determined; the results are given in table 1.

Part 2.—To 518 units of whole blood was added 5 ml. of diphenhydramine hydrochloride (50 mg.) and to 474 a similar amount of saline control solution. The identities of the controls and diphenhydramine hydrochloride were withheld from the investigators until after all the transfusion reactions were evaluated. Daily rounds were conducted by the investigators in the hospital, and each recipient of whole blood was questioned concerning symptoms of a transfusion reaction. The definitions by which we classify transfusion reactions are those that are commonly employed. If a transfusion reaction appeared likely after questioning the patient or examination of the hospital record a questionnaire was filled out.

Part 3.—Known pyrogenic material MI-3 was administered to rabbits, some of which were treated with tripelennamine, chlorprophenpyridamine maleate, and diphenhydramine hydrochloride. The pyrogenicity of this material was verified by use on three rabbits prior to the making of the study. This pyrogen was made from a culture of Pseudomonas aeruginosa. The final product consists of a mixture of polysaccharides, glucosamine, and nucleic acids.

RESULTS

The results of the effect of diphenhydramine hydrochloride on plasma hemoglobin are given in table 1. They indicate that the effect of diphenhydramine hydrochloride in the concentration employed is not unlike that of an equal volume of 0.9% sodium chloride solution. The conditions of Lucia and co-workers' [7] study in which hemolysis with diphenhydramine hydrochloride was observed are different in that they used concentrations of 1 and 2% that are not employed in clinical practice. The addition of 50 mg. of diphenhydramine hydrochloride to approximately 500 ml. of whole blood results in a 0.01% solution of diphenhydramine hydrochloride.

In part 2 of this study, numbered vials were used so that it was impossible for us to know which vial contained diphenhydramine hydrochloride and which one contained saline solution. The blood bank technician added the contents of one vial to every container of whole blood before it was stored for future use. We did not rely on transfusion reaction reports by nurses, clinical interns, and residents but felt it was necessary to question each patient individually as to signs and symptoms of the various transfusion reactions. Forty-four of the "treated" bottles were subsequently rejected because of such factors as clotting and positive serology. The results of the study are expressed in table 2. It can be seen that the addition of diphenhydramine hydrochloride completely eliminated the allergic type of transfusion reaction, but had apparently no effect on the incidence of pyrogenic reactions. The substantial reduction in allergic reactions that we observed is in agreement with all previously published reports. Our findings are not in agreement with those of Ferris [1] and Frankel [2] concerning the decreased incidence of pyrogenic reactions after the addition of antihistaminic materials. In this study the diphenhydramine hydrochloride was added shortly after the blood was obtained from the donor; our experience indicates that this is a safe procedure. This is not a practical solution to the problem, however, since some patients receive many transfusions in a relatively short period of time, and the possibility of an overdose of diphenhydramine hydrochloride exists. It sometimes happens that a patient receives as many as 30 units of whole blood

TABLE 2.—*Effects of Diphenhydramine Hydrochloride on Incidence of Transfusion Reactions*

Reactions	Reactions of 948 Transfused Patients No.	%	Diphenhydramine Hydrochloride in 495 Transfusions No.	%	Saline Solution in 453 Transfusions No.	%
Pyrogenic	20	2.2	11	2.2	9	2.0
Allergic	5	0.5	0	0.0	5	1.1
Hemolytic	1	0.1	1	0.2	..	...
Others	0	0.0	..	...	..	...
Total	26	...	12	...	14	...

4. Simon, S. W., and Eckman, W. G., Jr.: Use of Chlor-Trimeton in Prevention of Blood Transfusion Reactions, Ann. Allergy **12**: 182 (March-April) 1954.

5. Alfonsi, P. L.: Treatment of Certain Post-Transfusion Reactions with Antihistamine, Gazz. med. ital. **111**: 71 (March) 1952.

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7. Lucia, S. P.; Hunt, M. L., and Bierman, H. R.: Influence of Antihistaminic Agents on Erythrocyte Agglutination and Related Phenomena, J. Lab. & Clin. Med. **41**: 574 (April) 1953.

8. Ham, T. H.: A Syllabus of Laboratory Examinations in Clinical Diagnosis: Critical Evaluation of Laboratory Procedures in the Study of the Patient, Cambridge, Mass., Harvard University Press, 1950, p. 100.

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in 12 hours, and such a patient certainly would suffer from the toxic effects of diphenhydramine hydrochloride if 50 mg. were added to each unit. The practicable way to add the diphenhydramine hydrochloride, and insure that no patient would receive an overdose, would be to add the material just before administration. For patients receiving multiple transfusions the material could be added to only a few of the units to be administered. The danger of bacterial contamination of the blood would likewise be lessened if the material were added immediately prior to transfusion since there would be no time for multiplication of bacteria that might be inadvertently introduced. The characteristic of a mild sedative effect of diphenhydramine hydrochloride is usually a desirable feature.

TABLE 3.—*Effect of Tripelennamine (Five Milligrams per Milliliter) on Pyrogenic Reactions in Rabbits*

Rabbit No.	Weight per Kilogram	Temperature, F			
		Control	1st Hr.	2nd Hr.	Results
82 *.....	1.8	102.7	103.6	103.0	+ 0.9
83 *.....	1.9	103.0	103.7	103.5	+ 0.7
84 *.....	2.1	103.1	104.2	103.9	+ 1.1
85 †.....	2.4	103.0	102.5	102.8	− 0.2
86 †.....	2.0	102.8	102.7	102.7	− 0.1
87 †.....	2.2	103.3	103.3	103.2	Same
88 ‡.....	2.1	102.7	103.8	103.5	+ 1.1
89 ‡.....	2.2	103.1	104.6	104.1	+ 1.5
90 ‡.....	2.2	102.9	104.2	104.2	+ 1.3
91 §.....	2.5	103.1	103.0	103.2	+ 0.1

* Received 0.3 mg. per kilogram of MI-3 pyrogen (1:10 dilution = 0.3 mg. per milliliter) intravenously.
† Received 5 mg. per kilogram of tripelennamine subcutaneously.
‡ Received 5 mg. per kilogram of tripelennamine subcutaneously and 15 minutes later 0.3 mg. per kilogram of MI-3 pyrogen (1:10 dilution = 0.3 mg. per milliliter) intravenously.
§ Received 5 ml. per kilogram of a 0.9% sodium chloride solution intravenously.

In part 3, known pyrogenic material was administered to rabbits that had been divided into a control group and a test group by antihistaminic agents. Results of these studies are given in tables 3, 4, and 5 and indicate that the drugs tested do not influence reactions to known pyrogens. These findings were not unexpected since the clinical use of diphenhydramine hydrochloride reported above did not decrease the incidence of pyrogenic reactions resulting from blood transfusions. As pointed out above, this is in disagreement with the reports of Ferris [1] and Frankel.[2]

TABLE 4.—*Effect of Chlorprophenpyridamine Maleate (One Milligram per Milliliter) on Pyrogenic Reactions in Rabbits*

Rabbit No.	Weight per Kilogram	Temperature, F			
		Control	1st Hr.	2nd Hr.	Results
92 *.....	2.2	103.3	104.1	103.6	+ 0.8
93 *.....	2.4	103.0	103.7	103.7	+ 0.7
94 *.....	1.9	102.9	103.8	103.4	+ 0.9
95 †.....	1.9	103.1	103.1	103.1	Same
96 †.....	1.9	103.0	102.8	103.0	− 0.2
97 †.....	1.6	103.2	103.1	103.0	− 0.1
98 ‡.....	1.9	103.1	104.5	104.0	+ 1.4
99 ‡.....	2.3	102.8	104.0	103.3	+ 1.2
100 ‡.....	1.9	102.9	103.9	103.9	+ 1.0
102 §.....	2.5	102.9	103.0	103.1	+ 0.2

* Received 0.3 mg. per kilogram of MI-3 pyrogen (1:10 dilution = 0.3 mg. per milliliter) intravenously.
† Received 1 mg. per kilogram of chlorprophenpyridamine maleate subcutaneously.
‡ Received 1 mg. per kilogram of chlorprophenpyridamine maleate subcutaneously and 15 minutes later 0.3 mg. per kilogram of MI-3 pyrogen (1:10 dilution = 0.3 mg. per milliliter) intravenously.
§ Received 5 mg. per kilogram of a 0.9% sodium chloride solution intravenously.

SUMMARY

The addition of 50 mg. of diphenhydramine (Benadryl) hydrochloride to one unit of whole blood does not cause significant hemolysis. Diphenhydramine hydrochloride will eliminate allergic transfusion reactions but has no apparent effect on the incidence of pyrogenic reactions. Diphenhydramine hydrochloride, chlorprophenpyridamine (Chlor-Trimeton) maleate, and tripelennamine (Pyribenzamine), when employed as outlined above, will not prevent pyrogenic reactions in rabbits that have received known pyrogens.

TABLE 5.—*Effect of Diphenhydramine Hydrochloride (Five Milligrams per Milliliter) on Pyrogenic Reactions in Rabbits*

Rabbit No.	Weight per Kilogram	Temperature, F			
		Control	1st Hr.	2nd Hr.	Results
103 *.....	2.4	103.5	104.1	104.0	+ 0.6
104 *.....	2.0	103.3	104.4	103.9	+ 1.1
105 *.....	2.2	102.8	103.2	103.7	+ 0.9
106 †.....	2.5	103.4	103.7	103.5	+ 0.3
107 †.....	2.5	103.1	103.0	103.0	− 0.1
108 †.....	2.3	102.9	103.2	103.1	+ 0.3
109 ‡.....	1.9	103.3	103.6	103.9	+ 0.6
110 ‡.....	2.0	103.0	103.9	103.4	+ 0.9
111 ‡.....	2.5	103.1	104.2	103.9	+ 1.1
113 §.....	2.0	102.9	103.1	103.1	+ 0.2

* Received 0.3 mg. per kilogram MI-3 pyrogen (1:10 dilution = 0.3 mg. per milliliter) intravenously.
† Received 5 mg. per kilogram of diphenhydramine hydrochloride subcutaneously.
‡ Received 5 mg. per kilogram of diphenhydramine hydrochloride subcutaneously and 15 minutes later 0.3 mg. per kilogram MI-3 pyrogen (1:10 dilution = 0.3 mg. per milliliter) intravenously.
§ Received 5 mg. per kilogram of a 0.9% sodium chloride solution intravenously.

Use of Radioactive Isotopes.—Isotopes can be used in clinical research in two principal ways: first, to simplify existing analytic or diagnostic methods; and second, to study phenomena that cannot be examined readily, if at all, by conventional biochemical methods. . . . It is possible to conduct studies with radioisotopes that are probably not worth doing. A simple example will illustrate the point. . . . It should be possible to prepare radioactive phenolsulfonphthalein (PSP) and perform clinical tests of kidney function, using the labeled material. The results would be determined with a Geiger counter instead of an old-fashioned comparator block, or a colorimeter. Unless a very large increase in accuracy resulted, or unless it was found to be much simpler technically, there would be no advantage in the substitution of the radioisotopic method, since it could not yield any new information about the kidneys that was not obtained by the familiar, less dramatic procedure. In contrast to this, consider the use of radioisotopic methods to measure blood volume. The Evans blue dye method and the I^{131}-labeled human serum albumin method are equally useful for the estimation of plasma volume. The radioisotopic procedure, however, is simpler to perform, can be repeated at more frequent intervals, and is technically more accurate than the blue dye method. Any plasma volume method that depends on the tagging of albumin is unreliable in certain classes of patients; for example, those in congestive heart failure. In such conditions other methods of measuring blood are preferred. The easiest and most reliable methods for determining the volume of the red cells and the blood volume involve the use of radiochromium or radiophosphorus.—G. V. LeRoy, M.D., Clinical Research Using Compounds Labeled with Radioactive Carbon and Hydrogen as Tracers, *Annals of Internal Medicine*, February, 1955.

A SURGEON TAKES A SECOND LOOK AT SURGERY

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In 1805 Philip Syng Physick was made professor of surgery in my alma mater, the first time anyone, to my knowledge, was elected solely to a chair of surgery in any school of medicine. Harvey's discovery of the circulation had been made nearly 200 years previously, and Malpighi had described the capillaries nearly half a century before Physick's appointment was made. John Hunter had laid the foundation for pathological anatomy. Humphry Davy, working in Dr. Beddoes' Pneumatic Institute, had stated a few years previously, "Since nitrous oxide is capable of annuling pain, it might be used in surgical operations in which there is no great effusion of blood." While medicine, and surgery as a part of it, was still in large part steeped in medieval empiricism, here and there were to be found men who were calling on science to assist in dispelling mystery and revealing the truth. Some there were who were even then exposing frauds and correcting palpable errors, and a few were making worth-while discoveries. Not long thereafter Beaumont began the first experiments on gastric physiology on Alexis St. Martin, in what was then the wilderness of this great North-Central West. His exciting adventures into human gastric physiology, marked by patience and ingenuity, laid the foundation for much that has been done in more recent years in this and other institutions. Beaumont was the first surgical physiologist, a credit to his country and his profession.

And yet, in spite of all that had gone before, the 19th century opened and was nearly half over before even one of the great deterrents to surgical achievement was in part overcome. Pain, hemorrhage, and infection prevented surgical progress. A serious lack of fundamental physiological knowledge likewise prevented significant progress in the whole field of medicine. Only the most intrepid of surgical adventurers were opening the abdomen by the 1850's. "Laudable pus" was still accepted, and only occasionally were there those who questioned the truth of that concept. When the century closed, modern research in the basic medical sciences was firmly established. We had come to understand, more intimately than ever before, the intricate relationships of certain systems of the body. The study of the pathology of terminal disease was being replaced by the study of the pathology of early disease. In surgery, Deaver was already talking of "the pathology of the living." There were those like S. Weir Mitchell, who had realized that mental reaction had, in part at least, its explanation in the ills of a sick body and likewise that nonorganic disease might well mimic the symptoms caused by an organic lesion.

EXPANSION OF SURGERY

Into this scene, along with a galaxy of American individualists in surgery, came William and Charles Mayo. They had a proud heritage in medicine. As Halsted founded a new concept in the training of young surgeons, they founded a new concept in organization and care. They proved beyond question that it was not necessary to sacrifice intellectual ambitions and achievement in a group effort. They wisely nourished the institution that they founded and guided it with loving care, devoid of the ruthlessness that so many of their contemporaries showed young men who were attracted to this rapidly expanding field of endeavor. If they had not shown the wisdom that they did, they and their associates would not have achieved what they have and surgery might not be what it is. There can be no doubt but that group medicine in the finest sense was the result of their imagination, influence, and guidance.

The Mayo brothers were skillful surgeons; they were excellent physicians; and they were wise and generous men. They realized that research would play an important part in the progress of medicine. When the clinical departments of many of our medical schools were devoid of any activity in fundamental research, they had established a laboratory of surgical research and were fostering research in many other important fields. They were not blinded by the generally accepted concept of their day that surgical therapy began and ended at the operating table. A careful study of their lives convinces me that they were among the first of those who accepted and who fathered the renaissance in surgery that began in the early part of this century—a period that introduced the "second look" at surgical effort. Basic fundamental knowledge began to move forward at an amazing tempo and with it moved clinical surgical effort. Areas of the body began to be explored with renewed vigor and with a degree of safety that was previously impossible.

Harvey Cushing in an address at the 17th International Congress of Medicine in August, 1913, entitled "Address in Surgery on Realignments in Greater Medicine," called attention to the then rapidly expanding frontiers of specialism in surgery and prophesied that in addition to gynecologic, urologic, orthopedic, and neurosurgical specialism would come thoracic, cardiac, vascular, and sympathetic nervous system surgery. With broader and firmer concepts of visceral function, older long-standing conceptions began to vanish, and surgeons began to think in terms of the reestablishment of normal function by operation.

It was but a step from this to special forms of therapy to improve a variety of abnormalities of function prior to anesthesia and operation and to maintain normal function of many important systems in the postoperative period, until the body as a whole was able to police its own normal functional activity. The pernicious abnormalities of visceral dysfunction, one after another, became common knowledge to all surgeons who read current surgical literature. Processes that previously had seemed extraordinarily complicated, even to scientists, now were, at least superficially, understood by men whose laboratory training stopped when they graduated

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V 15
1955

from medical school. Surgical effort was rapidly extended; surgical morbidity and mortality became smaller and smaller.

APPLICATION OF PHYSIOLOGICAL CONCEPT

The surgeon's horizon expanded so rapidly that Billroth's prophesy, "Die innere Medizin muss mehr und mehr chirurgisch werden," became a reality. Surgery of the thoracic viscera successfully eradicated serious pulmonary disease and corrected congenital cardiac and aortic abnormalities and acquired valvular defects of the heart. Artificial hearts were developed by several surgeons with an interest in such mechanisms and a sound background in physiological research. In this institution a further step was initiated by successfully using the heart and lungs of a living donor to supply blood to important viscera of the patient when necessity demanded that blood be diverted from the patient's heart. These thrilling adventures in surgical effort are being extended by the application of physiological concepts, some of which have been known for some years and some of which are the result of more recent research. Generalized cooling of the body, artificial hibernation—if you wish to call it by this misnomer—or selective visceral cooling are bringing about circumstances where less blood is required in a given period, and, in the end, vital visceral functions are not permanently impaired. It may even be possible to delay or prevent the development of shock following trauma by the sensitive, intelligent application of certain of these principles.

Daily the entire stomach is being removed, the entire pancreas, half a liver, and large sections of the most important blood vessels, and a host of other operations of great magnitude are being performed that only a few years ago were operative curiosities or were not being done at all. Surgical achievement and physiological knowledge now move forward together. The lag period between the development of new physiological knowledge and its application has been greatly shortened. And in all of this movement surgeons have not been only on the receiving end. Some of them have played important roles in extending the knowledge of physiological function. They have been taking a broader view of the surgeon's responsibilities—they have taken a "second look" at what the well-trained surgeon can accomplish in his daily work.

DRAWBACKS OF SPECIALIZATION

While the surgeon's horizon has become enlarged and his opportunities have expanded, his vision unfortunately has at times become restricted. Specialization has many drawbacks that must be considered when we acknowledge the worth-while contributions that have come from it. It may all too frequently narrow the outlook of the individual and dull his sensibilities to the interrelationships of visceral function. There is a shocking lack of appreciation of the importance of rigorous training in general surgery as the cornerstone upon which all surgical achievement has and will, in all probability, continue to be founded. Too rigid a restriction of the surgeon's outlook may not be the ideal method of continuing to expand successfully surgical effort. We must, before it is too late, take a "second look" at this very important matter. Even though the surgeon's final efforts may be directed in a relatively narrow field, the surgeon's training must be as broad as it is possible to make it.

While there are those who still believe that the training of the modern surgeon can be accomplished by a program that makes no provision for increasing opportunity and responsibility for patient care during the period of training, the weight of evidence does not support such a concept. Preoperative and postoperative care can be mastered in both systems of training largely because busy surgeons are usually willing to delegate these responsibilities to young men in training, but the old adage that "practice makes perfect" is still true in surgery as it is in many other technical professions. The only way to train a surgeon is to give the trainee under supervision the opportunity to operate and the responsibility for the care of patients.

The restriction of clinical material available for training in the Halsted sense, brought about by the extension of voluntary insurance plans, may well have a serious effect on our training programs. It is to be hoped that a more happy solution of this vexing problem will be found before future surgeons are faced with the necessity of achieving technical competence on patients coming to them after they have become engaged in practice, a time at which they may not have the supervision of men with sound surgical judgment and experience. Ward facilities in our great teaching and training centers must not be further restricted because of the financial outlook of our hospitals. Young men in training will not gain operative competence by opening and closing wounds, or even by doing limited portions of an operation. They gain necessary technical competence by being given full patient responsibility in the final period of their long training. This is becoming increasingly difficult to achieve, and in some places the methods used to achieve it are not beyond criticism. The entire matter must also receive a "second look" before it is too late to remedy the defects in training that are even now taking place. The necessary training will not be obtained by the use of a variety of subterfuges now being countenanced without having a profound effect on the morality of many of those who partake of this type of training.

SURGERY AND ANESTHESIOLOGY

Modern surgical achievement owes a real debt to a simultaneous improvement in anesthesiology. Here and there will be found those who still maintain that the nurse anesthetist is just as competent as her medical counterpart. If this be true, the whole philosophical background that we have accepted in regard to the modern surgeon is in error. Every surgeon who has had assistance from well-trained medical anesthesiologists frankly acknowleges his obligations to these specialists. Modern achievement in surgery would not have been possible without simultaneous expansion of the anesthesiologist's knowledge. The modern anesthesiologist must have a broad background in cerebral, cardiovascular, and respiratory physiology. Further progress in both fields of effort will very likely go forward together.

The surgeon and the anesthesiologist must take a "second look" at their relationship. That this is necessary should hardly need to be pointed out. Viewing these professions separately, without regard to the intimate rela-

tionship that exists between them, we will find they are moving toward further misunderstanding, but, viewing them together, we will without doubt come to the conclusion that this relationship justifies closer study and scrutiny and a deeper and more logical understanding. A "second look" at this whole relationship will, I am sure, disclose how absurd this has all become. Each group has come to believe that the one is blind to the qualities of the other, without realizing that such an attitude is of no tangible use to the solution of the problem. Once this is realized, once the complexity of the position of each group is accepted and the stresses involved are understood, we will find little difficulty in solving what now seems to be a well nigh insoluble problem. A "second look" will doubtless bring both groups to a broader understanding, a circumstance that is highly desirable.

APPLICATION OF MORGAN'S PRINCIPLES

John Morgan founded the first medical school on the North American continent, and, in his inaugural address, "A Discourse upon the Institution of Medical Schools in America," given on May 30, 1765, he laid down the principles that should guide medical schools on this continent. In taking a "second look" at surgery, one might well review the principles that Morgan laid down. In his preface Morgan stated that professors in our medical schools required leisure from the "overhurry" of medical practice. The wisdom of this has been repeatedly proved in many of our medical schools and must be more widely adopted for those who become responsible for surgical services in great hospitals, whether they are teaching hospitals connected with medical schools or otherwise.

The first requirement that Morgan laid down was that every graduate should know the whole range of natural philosophy. If one were laying down the principles by which surgery and the surgical specialties should be guided, one would say that young men in training, either in general surgery or in any of its specialties, should be trained with a broad background in the principles of general surgery. Various of the specialty boards are beginning to realize the importance of this general principle, but too often they are paying lip service to it rather than accepting it as the basis for the development of surgery as a whole. Morgan stated that young trainees in medicine should be able to read Latin, Greek, and French and have a wide acquaintance with mathematics and the sciences. One might paraphrase this by saying that our trainees in surgery and the surgical specialties should have a broad background in modern languages so that they may be able to read the best in current medical and surgical literature. Similarly, they must have a background in mathematics and the sciences, if they are to have a really fundamental understanding of preoperative and postoperative therapy and of those procedures best calculated to restore normal function.

Morgan laid down the principle that medicine should develop within itself "the form of a regular science." I would paraphrase this by saying that surgeons should be doctors in a broad sense and not merely "operators." If this can be more generally accomplished, the surgeon's status in medical science will be elevated, but, if it is not, the surgeon will continue to be the "handmaiden to the internist." Morgan stated that clinical lectures by physicians should form an integral part of instruction in the medical school that he was founding. I would paraphrase this by saying that every course of training for general surgeons, or the surgical specialists, should be a broadly planned course of training in the basic medical sciences as these apply to clinical medicine and surgery, so as to provide a background for deep understanding of the mechanisms involved in surgical diseases and the complications occurring from anesthesia and operation.

Morgan stated that medicine could not be learned by the new students coming to the medical school "without we follow a certain order." I would paraphrase this by reiterating that any training course in surgery must be one that provides increasing opportunities and responsibilities with increasing periods of training. Far too often in the residency programs in many of our hospitals the trainees are doing essentially the same type of work in the final year of training as they did in the first or second year of training. These programs must, if we are to continue our preeminence in the field of surgery in this country, follow a definite order that will provide a deeper understanding and a fuller opportunity during the training period. He then stated, "we must dive into the bottom of things by repeated and different experiments, and, as it were, force nature to yield herself up to our inquiries." While all of the young men being trained in surgery cannot be expected to do important research, there can be little doubt but that they would have a deeper understanding of what they were doing if they had the opportunity of spending a period of time in one of our surgical research or basic science laboratories.

SUMMARY AND CONCLUSIONS

If we accept these general principles laid down by Morgan nearly 200 years ago, we can so adjust our program of training in surgery from time to time as to keep it abreast of the best in instruction and training and thus maintain a standard of excellency in American surgery that will not be surpassed by any other country. If, on the other hand, the trainee and those responsible for training accept the concept that surgical success depends solely upon the ability, technically, to do an operation; upon the amount of surgery that an individual does rather than upon the excellence of the end-results; and, finally, upon the fact—all too frequently accepted by many young trainees—that success in surgery depends primarily upon the income of the individual rather than upon the degree to which the individual can contribute to the welfare of his fellow citizens, surgery as an important part of the art and science of medicine will mark time or move backward. We must continue thoroughly to review our position in these matters by taking a "second look" not only at what has been accomplished but also, even more important, at what can be accomplished.

There are many reasons why we must look more carefully at the candidates we select for training, the program we offer them, and the leadership we show them. There are many reasons why, in addition to training men who will advance the borders of surgical effort, we should at the same time endeavor to train men who have a deep appreciation of man as a man. Many of the evil practices that have befallen us are due to the fact that we have not fully taken these matters into account.

V 1
195

RECENT TRENDS IN MANAGEMENT OF CRANIOCEREBRAL INJURIES

A PLEA FOR PREVENTION OF DEATHS FROM REVERSIBLE INJURIES TO THE BRAIN

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In vain have there been a wealth of excellent papers written on the subject of brain injuries, because the incidence of death from reversible injuries to the brain is ever increasing.[1] All this brilliant work is no more than buried treasure, for the family doctor who sees the patient first has not been made aware of the important danger signals warning of approaching coma and hemorrhage. It would be worthy of a whole volume if we could but impress the general practitioner of just one point, namely, the presence or absence of visible or obvious scalp or skull injury has little or no bearing on the degree of injury to the brain. We also wish that the general practitioner be made aware of the possibility of his limitations and be humble enough to seek help before it is too late.

Very often the neurosurgeon may have a good hunch that a ruptured spleen or injury to the urinary bladder is present, but it is only the general surgeon, who is accustomed to the feel of the abdomen in his daily work, who can make the positive diagnosis; by the same token the neurosurgeon can more readily tell the state of the brain injury if given the chance to accept the responsibility. The roentgenologic evidence of an unbroken skull lulls the physician into a false sense of security, and the patient is often permitted to develop a surgical hemorrhage, without the benefit of intervention. This false security may be likened to the dangers of a bomb, without the convenient tick-tocking audible clock mechanism foretelling of approaching disaster.

We should realize that an empty prepared skull, not containing a brain, throws shadows on the x-ray screen almost identical to those of a skull containing a live brain. Unless there is evidence of a compound head wound, I rarely take skull x-rays until the patient is recovering and before he leaves the hospital.

The mismanagement of brain injuries is due largely to standardized misconceptions that are copied from one textbook into another. There are certain fixed misconceptions that the public holds and those fixed misconceptions that the doctor holds. In the development of the surgical hematoma, the standard textbooks usually describe the conscious or lucid interval preceded by a short period of unconsciousness caused at the moment of injury and followed by slowly developing stupor and coma. In one series of 25 patients [2] with surgical hemorrhage, 22 suffered only a minor injury, while 11 had no initial period of unconsciousness. Many a patient accused of drunk driving has been found dead of a meningeal hemorrhage in the county jail. Many a patient with a cerebral concussion has died of a ruptured spleen.

I will now discuss some observations on craniocerebral injuries (hemorrhage, contusion, and concussion) based on some 20,000 cases observed on the neurosurgical service at the Los Angeles General Hospital. The surgical hemorrhage is a problem in diagnosis. The cerebral contusion is a problem in management. The cerebral concussion is a problem that will need proper interpretation. The patient with cerebral concussion will survive regardless of treatment; nevertheless, it is a problem that will need proper interpretation and evaluation, for, if the condition is not properly treated, it will leave ghosts in the form of many sequelae.

POSTCONCUSSION SYNDROME

Several observers have noted that the disturbed vasomotor and exhaustion syndromes, associated with some cases of cerebral concussion, are more prevalent with the less severe injuries than in those with severe head trauma associated with a long period of unconsciousness. In reviewing the "alarm reaction and the general adaptation syndrome," it may be recalled that, when any living organism is placed in abnormal conditions that endanger its vital equilibrium, the sum of the biological phenomena that take place is called the "alarm reaction" and that this reaction is identical, regardless of the nature of the alarming agents—be they medical, surgical, or psychic. It is my feeling that the postconcussion syndrome in patients who have suffered only a moderate cerebral concussion is a manifestation of the "alarm reaction" as first emphasized by Selye.[2a]

INTERVAL INTRACRANIAL HEMORRHAGE

Interval hemorrhage is delayed intracranial bleeding that develops in either the extradural or the subdural space after injury to the brain. The injury may be slight. The typical interval hemorrhage involves the middle meningeal artery. The sequence of events in this type of bleeding is as follows: The patient receiving a blow to the head, usually after a momentary period of unconsciousness, gets up and goes about his usual duties. During the injury, the middle meningeal artery has been torn. Within one or two hours the patient complains of headache and often will place his hand over the region of the developing hemorrhage. Because of its location outside the dura, the bleeding artery produces an accumulation of blood between the dura and the cranial vault, and this stripping away of the dura from its attachment to the vault produces the pain. As the dura is being separated from the inner surface of the skull, other small branches of the meningeal artery are torn, and in this way the hemorrhage grows in size. This process within a few hours results in the accumulation of considerable tumor of blood, with resultant increase in intracranial pressure

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Read before the Southern California Section of the American College of Surgeons, Santa Barbara, Feb. 7, 1954.

1. (*a*) Evans, J. P., and others: Acute Head Injury, U. S. Armed Forces M. J. **2**: 1001-1017 (July) 1951. (*b*) Raaf, J.: Advances in the Management of Acute Craniocerebral Injury, West. J. Surg. **60**: 597-605 (Dec.) 1952. (*c*) Walker, A. E.: Practical Considerations in the Treatment of Head Injuries, Neurology **1**: 75-84 (Jan.-Feb.) 1951.

2. Seletz, E.: Interval Intracranial Hemorrhage: Its Diagnosis and Management: Analysis of 25 Cases, Arch. Surg. **45**: 177-182 (July) 1942.

2a. Selye, H.: The Physiology and Pathology of Exposure to Stress: A Treatise Based on the Concepts of the General-Adaptation-Syndrome and the Diseases of Adaptation, Montreal, Canada, Acta, Inc., 1950.

as well as pressure on the motor cortex of the brain. This relatively sudden increase in intracranial pressure produces gradually increasing drowsiness, stupor, and finally, coma, with slowing of the pulse and the respirations and contralateral motor weakness and perhaps paralysis. Frequently these symptoms are ushered in by a convulsion. Because of the anatomic location of the hemorrhage, pressure is exerted first in the face, then the arm area of the motor cortex; the convulsion begins in the face and the arm, and the paralysis develops in the same sequence, finally involving the lower extremity.

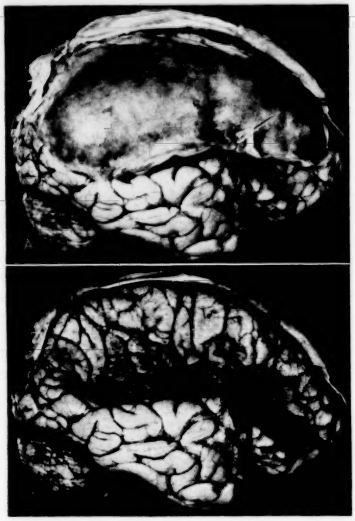

Fig. 1.—*A*, brain at autopsy, showing an encapsulated subdural hematoma. *B*, the hematoma has been removed, showing depression of the cortex.

During the development of the acute intracranial pressure, there is a rise in the systolic blood pressure, while the diastolic remains relatively unchanged; this gives rise to a high pulse pressure with a characteristic full volume pulse. I have often seen blood pressures of 150 mm. Hg systolic and 60 diastolic or 180 systolic and 60 diastolic with a pulse pressure of 90 to 100. Spinal fluid findings show elevated pressure; the fluid is usually clear. Spinal punctures are dangerous in a case of suspected extradural hematoma and are of little or no value in diagnosis other than to reveal a high intracranial pressure.

By far the most important single symptom of progessive intracranial bleeding is a deepening coma. Every patient with a history of head injury, who several hours later goes into a coma from which he cannot be roused, surely has intracranial bleeding.[1a] Another important sign that develops in about half of the patients is a dilated pupil on one side—on the same side as the hemorrhage. The dilated pupil, when present, is of great value in localization, even more so than the motor paralysis. A large hematoma extending over almost an entire hemisphere has been found to produce a shift of the brain, with resultant pressure on the brain stem of the contralateral side, giving rise to confusing motor symptoms. The dilated pupil in these instances is of more reliable localizing value than the motor paralysis. The following case illustrates the importance of this sign.

A white man, aged 58, was struck by an automobile while he was crossing an intersection. He was accompanied by his wife. After momentary unconsciousness, he arose and walked, unassisted, to the curb. He asked his wife what had happened to him, since he did not recall being struck. This occurred at about 6:30 p. m. About 8:30 p. m., he complained of a rather severe headache, placed his hand over the left part of the forehead and the left temple, and admitted severe pain in that region. At 10 p. m., he was unable to talk. The family noted twitchings at this time about the right side of the face and the mouth, and shortly thereafter he became unconscious and had a severe generalized convulsion. He could not be awakened after the convulsion. At 11 p. m., the family physician arrived and was angry at being called to attend a patient who was virtually dead. He advised them to call the coroner's office. I saw the patient a half hour later, when he was brought to the hospital. His condition was critical.

Examination revealed the patient in deep coma, with a pulse rate of 46, a respiratory rate of 16, and blood pressure of 180 mm. Hg systolic and 90 diastolic. There was present complete flaccid paralysis of the right side of the body; the respiration was of the characteristic blowing variety; the inspirations were slow and deep, and the expirations were short and forceful. There was a puffing out of the cheeks with each expiration. The Babinski sign was present bilaterally. The left pupil was greatly dilated. No time was taken for making roentgenograms or spinal puncture. A subtemporal craniotomy was done on the left side, with the patient under local anesthesia (induced with 2% procaine hydrochloride). Black tarry blood extruded immediately through the first perforator opening. A large extradural hematoma was found and removed; it extended over the temporoparietal region. The torn middle meningeal artery was found and sealed by electrocoagulation. The patient became conscious the following morning and made a good recovery.

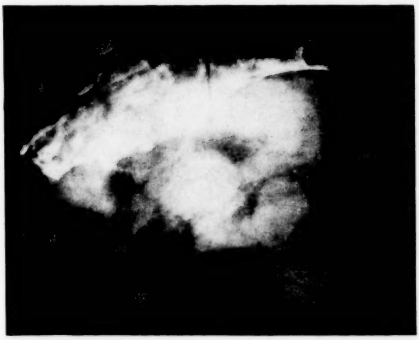

Fig. 2.—Roentgenogram of the brain, showing a calcified subdural hematoma.

CHRONIC SUBDURAL HEMATOMA

The type of hemorrhage just discussed is arterial in origin and develops in 4 to 12 hours after the injury. There is another type of hemorrhage that is venous in origin and, therefore, much slower in development. This type develops subdurally and may take many weeks or even months to form; it is, therefore, known as chronic subdural hematoma. Eighteen of the patients in series

of 25 had hemorrhage of this type.[2] This hemorrhage originates from a torn venous sinus or a large cortical vein, entering the longitudinal sinus. This lesion consists of a collection of semiliquid blood in the subdural space and differs from the extradural type in that it becomes encapsulated and is never absorbed (fig. 1). The blood is eventually broken down and the pigment slowly removed until finally, in a hematoma of long duration, an

Fig. 3.—Shift of the pineal shadow in the presence of subdural hematoma (the Naffziger sign).

encapsulated collection of clear fluid results. I have observed this condition in a patient with a history of mental symptoms of many years' duration. The capsule in this instance was calcified to the extent that drill and rongeurs were necessary to open it (fig. 2). The patients may occasionally go on for many years complaining of headaches; frequently mental symptoms develop. In these cases, brain tumor is suspected, even after ventriculographic studies.

Aids in Diagnosis.—X-ray of the skull may show a shift of the pineal body (Naffziger's sign) (fig. 3). The ventriculogram will show a shift and depression of the ventricles (fig. 4). Frequently the hematoma will be encountered through the perforator opening, and air injection may be avoided. Cerebral angiography, in case of subdural hematoma, shows a very characteristic depression of the vascular pattern (fig. 5). Electroencephalography may also aid in the diagnosis, by showing amplitude asymmetry over the involved hemisphere. At operation, the presence of chronic subdural hematoma is a welcome sight, since it is one of the most benign of the lesions that give rise to increased intracranial pressure.

Almost every day the daily newspaper relates the story of an injured child who is rushed to the receiving hospital with screaming sirens—only to be sent home by the intern or orderly in attendance when it regains consciousness or stops crying. A day or two later, when the child is found unconscious, instead of consulting a specialist, the family doctor rushes the child to the hospital, and, like the traditional painting of the physician, sits by the bedside and comforts the parents until the child, with the surgically curable hematoma, finally dies.

CEREBRAL CONTUSION

A patient with a cerebral contusion has suffered a bruising or laceration of one or more parts of the brain.[3] This patient is rendered immediately unconscious and may remain so for an indefinite period of time—hours, days, or even weeks. One such patient recovered after a six week period of unconsciousness. The severity of the injury may be judged by the depth of coma and duration of unconsciousness. The general appearance of the patient should be observed carefully in the determining of the depth of coma; his facial expression, whether the muscles of the face are firm or loose and flabby as in the deepest stage of surgical anesthesia, the position of the patient in bed, his posture, and the degree of relaxation of the patient should be noted. Any patient who will permit himself to lie in a cramped or uncomfortable position is in deep coma. The severe cerebral contusion is recognized by the early development of hyperthermia;

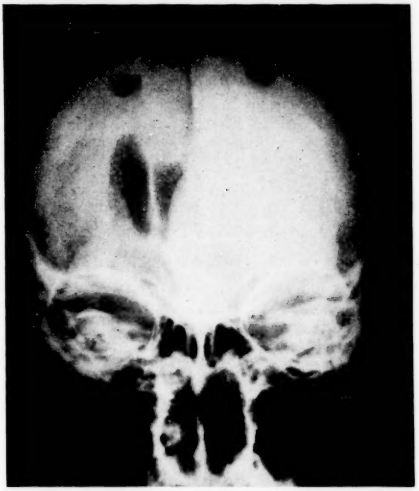

Fig. 4.—Ventricular displacement caused by presence of subdural hematoma.

rapid, bounding pulse; and rapid, moist breathing. If these patients show extensor spasms of all extremities, called decerebrate rigidity, the outlook is critical, for there is often associated injury in the pons or medulla.

Management.—In the management of cerebral contusions anoxia should be avoided. Good respiratory ex-

3. Pudenz, R. H., and Shelden, C. H.: The Lucite Calvarium—A Method for Direct Observation of the Brain: II. Cranial Trauma and Brain Movement, J. Neurosurg. **3**: 487-505 (Nov.) 1946. Courville, C. B.: Coup Contrecoup Mechanism of Craniocerebral Injuries: Some Observations, Arch. Surg. **45**: 19-43 (July) 1942.

change is vital for the welfare and survival of the unconscious patient. The deeply comatose patient often lying on his back "may aspirate mucous, blood and vomitus." [4] It has been shown that the anoxemia resulting from inadequate respiratory exchange may produce greater damage to the brain than the original injury. One does not hesitate to perform the lifesaving procedure of tracheotomy in these patients.

Fluid protein and electrolyte balance is of paramount importance for survival and recovery in the treatment of the patient unconscious from craniocerebral injuries. The use of the nasal stomach tube has been found to be the most effective method for feeding this type of patient. Echols [5] points out that a good rule is to keep the urine output at 1 liter per day.

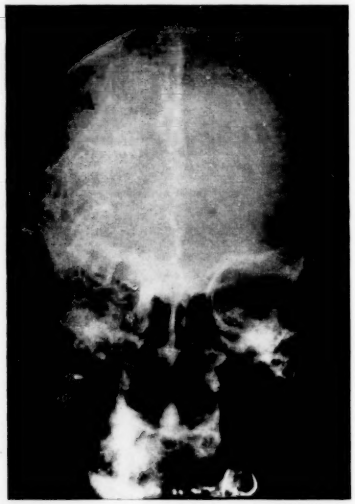

Fig. 5.—Cerebral (carotid) angiography in case of subdural hematoma, showing characteristic depression of the surface vascular pattern.

Hyperthermia must be combated by ice bags, cooled oxygen tent, or tap water enemas. The patient with a brain injury is often semistuporous or in coma. This type of person cannot protect himself against the onslaught of the vigorous or overzealous examining physician. Avoid undue manipulation, x-ray and spinal fluid studies, and unnecessarily minute neurological examination.

Restraints: Avoid confining restraints as much as possible. A comatose patient is not too deeply unconscious to suffer from nightmares and, when bound down by the restraints, spends his remaining strength fighting an unknown assailant. Most of these patients, if left alone, will toss about for a while and then assume some position, no matter how grotesque, that will be comfortable to them, and they may remain in that position for hours. Especially must one avoid restraints in regions where they may compress a major nerve trunk.

Associated Injuries: Brain injuries complicated by injury to viscera or extremities offer additional problems. Dean Echols [5a] states that, in examining a patient with brain injury, the preliminary examination should begin with a search for other lesions, especially ruptured viscera. Rupture of the spleen is not an infrequent complication. After ascertaining the degree of cerebral injury by such factors as the depth of coma, pulse, temperature, and respiration, the cause for any symptoms not ascribed to the cerebral injury must be looked for elsewhere. Thus, a patient not in deep coma, with gradual increase in pulse rate, respiratory rate, and red blood cell count, is bleeding from a source other than the brain. The abdominal finding in a ruptured spleen is a tenseness usually not comparable to the rigidity seen with other major visceral accidents. In those patients that I have observed, the symptoms have been a tenseness and distention of the abdominal wall, with increased tympanites obliterating the liver dulness and with diminution in intestinal paristalsis. Rarely, shifting dulness may be elicited, and, when it is, the patient has been almost exsanguinated. A rigid abdomen is sometimes seen when there is an associated back injury with irritation to the roots of the spinal cord that go to supply the muscles of the abdominal wall.

A rapid pulse or rapid respiration in a conscious patient with a head injury can never be due to the intracranial injury. Injuries to the chest and urinary bladder are often seen as complications in patients with head injury. Bladder injuries are frequently seen after motorcycle accidents. All patients with brain injury should be catheterized if they do not void within a few hours after the accident. In treating acute and severe head injuries in the aged patient, primary consideration is given the general condition of the patient rather than the injury.

405 N. Bedford Dr., Beverly Hills.

4. Adams, J. E.: The Treatment of Craniocerebral Injuries and Prevention of Anoxia, California Med. **75**: 321-323 (Nov.) 1951. Echols, D. H., and others: Tracheotomy in the Management of Severe Head Injuries, Surgery **28**: 801-811 (Nov.) 1950. Dickman, R. W., and Baronofsky, I. D.: Tracheotomy: One Solution for Pulmonary Problems in the Critically Ill Patient, Journal-Lancet **71**: 43-46 (Feb.) 1951.

5. (*a*) Echols, D. H.: Symposium on Surgery of Trauma: The Management of Acute Head Injuries, New Orleans M. & S. J. **102**: 97-101 (Sept.) 1949. (*b*) Bowen, A.: Preoperative and Postoperative Care, Modern Med. **17**: 47-52; 100-110 (April) 1949.

Potassium Deficiency.—Continued potassium deficiency in the course of protein repletion of protein-depleted rats causes congestive heart failure. At autopsy there is massive necrosis of the myocardium, non-inflammatory edema, and mild pulmonary congestion. The myocardial lesions are completely reversible if potassium is added to the diet, and after two weeks, necropsies reveal a normal myocardium. Clinical observations support our experimental findings. Patients who died of hypopotassemia may show marked disintegration of muscular tissue. A patient with leukemia who received extensive cortisone treatment, developed myocardial lesions strikingly similar to those seen in experimental animals with potassium deficiency. Similarly, DOCA administered to experimental animals produces (1) myocardial lesions (2) respiratory paralysis, and often a diabetes insipidus. The lesions which I have described as characteristic of potassium deficiency in the rat do not develop if sodium is also omitted from the diet. In other words, a shortage of sodium modifies both the effects of protein and potassium depletion. If animals which have been fed diets deficient in potassium and sodium are injected subcutaneously with sodium chloride, they die quickly, often within thirty minutes after injection. The postmortem examination shows a coagulation necrosis of myocardial fibers, suggesting that in the course of potassium deficiency sodium ion may become toxic.—Paul R. Cannon, M.D., Potassium-Sodium Relationship in Protein Metabolism, *The Illinois Medical Journal*, May, 1955.

SIGNIFICANCE OF SKELETAL LESIONS IN INFANTS RESEMBLING THOSE OF TRAUMATIC ORIGIN

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and
William A. Evans Jr., M.D., Detroit

In every clinic caring for a volume of children there are seen, from time to time, infants with skeletal lesions resembling those due to trauma but unaccompanied by readily volunteered and adequate account of injury. While such cases would appear to be of interest to a variety of disciplines, discussion of them has been chiefly by roentgenologists. Caffey [1] first emphasized the frequent association of chronic subdural hematoma and fractures of the long bones in 1946, but, since he was unable to obtain histories of violence in the material he considered, no conclusion as to the nature of this complex was advanced. He was also the first to point out the frequency with which defects in the metaphyses, as contrasted to the shafts of bones, were encountered. Smith,[2] in Canada, two groups in France,[3] and Lis and Frauenberger,[4] in this country, noted the same relationship in single infants but, likewise, advanced no valid explanation. Later Astley [5] in England described six babies with metaphysial discontinuity of bone similar to that described by Caffey and was so impressed by this feature as to subtitle his publication "Metaphyseal Fragility of Bone" this despite the coincidental presence of retinal separation, easy bruising, black eyes, compressed vertebrae, and "the more usual type of fractures,"—injuries only remotely related to a hypothetic metaphysial fragility. Silverman [6] tended toward a more positive approach when he presented three cases with fractures, which clinically had not been suspected, under the heading "Unrecognized Skeletal Trauma." Two of these patients had metaphysial lesions, and he chided pediatricians and orthopedists alike for laxity in obtaining reliable histories and for their naïve search into etiology other than injury to explain certain types of osseous pathology.

The fundamental questions raised by these publications are of obvious importance to the patient since Caffey,[1] Astley,[5] and Silverman [6] each has stressed that bone changes represent accumulations, rather than a single isolated event. They concern physicians acting in a wide variety of specialties and, furthermore, if this geographical area can be considered representative, the medicolegal implications of these obscure skeletal defects are proving embarrassing to both testifying physicians and the judiciary. Two lines of inquiry are especially pertinent to indicate a pattern for further thought, and these we phrase as questions. First, is there valid reason to separate clinical and roentgenologic similiarities into two groups on the basis of the presence or absence of a history of trauma alone? Second, is there tangible evidence to support the belief in the existence of syndromes of unknown etiology, such as unusual metaphysial fragility during infancy accompanied by a variety of extraneous injuries to other tissues or, chronic subdural hematoma associated with multiple metaphysial impactions? If the answers to these queries are in the negative and the view implied by Silverman is supported—that fractures in infancy are primarily due to trauma regardless of history and independent of the anatomic areas of bone involved,—then it is necessary to ask still a third question; what is the nature of the injury-prone environment that predisposes to skeletal lesions without history of violence and, especially, of that ménage in which the various defects accumulate episodically or continuously?

MATERIAL AND PROCEDURES

The material available at the Children's Hospital of Michigan for examination has included all infants admitted or treated in the emergency section because of injury during the period 1946-1954 as well as those with roentgenologic or clinical findings resembling those usually associated with trauma, even though no supportive history was obtained. In addition all x-ray films representative of various forms of bone pathology encountered during infancy were restudied in order to determine where confusion in interpretation might arise between them and examples known to be due purely to adverse lines of force. On the basis of this inquiry three general sets of statements can be made without enlargement since they are supported by evidence in each phase of the study and are in keeping with general experience. Material dealing with one part of our third question requires enlargement and the presentation of more detailed data.

First of all, when cases were grouped into anatomic entities, such as fracture of the femur or skull fractures, a recurring pattern for historic reliability was always manifest. The vast majority of infants in each category were seen as a direct outgrowth of a specific recognized accident, while a much smaller fraction required more than routine history-taking for clarification. A still lesser group fits in place only after social service investigation or interpretation in the light of earlier or later events. A small residue always remained, despite the diligence of inquiry, for which no satisfactory explanation could be developed. Objective comparison of the material falling

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Read before the Houston (Texas) Pediatric Society, Nov. 23, 1954, and, in summary, before the Michigan branch of the American Academy of Pediatrics, Detroit, Sept. 28, 1954.

1. Caffey, J.: Multiple Fractures in Long Bones of Infants Suffering from Chronic Subdural Hematoma, Am. J. Roentgenol. **56**: 163, 1946.

2. Smith, M. J.: Subdural Hematoma with Multiple Fractures: Case Report, Am. J. Roentgenol. **63**: 342, 1950.

3. Marquezy, R. A.; Bach, C., and Blondeau, M.: Hématome sous-dural et fractures multiplas des os longs chez un nourrisson de N. mois, Arch. franç. pédiat. **9**: 526, 1952. Marie, J., and others: Hématome Sous-dural du nourrisson associé à des fractures des membres. Semaine hop., Paris (no. 28) **30**: 1757, 1954.

4. Lis, E. F., and Frauenberger, G. S.: Multiple Fractures Associated with Subdural Hematoma in Infancy, Pediatrics **6**: 890, 1950.

5. Astley, R.: Multiple Metaphyseal Fractures in Small Children (Metaphyseal Fragility of Bone), Brit. J. Radiol. **26**: 577, 1953.

6. Silverman, F. N.: Roentgen Manifestations of Unrecognized Skeletal Trauma in Infants, Am. J. Roentgenol. **69**: 413, 1953.

into each group by both clinician and roentgenologist provided no basis for separation one from the other; a broken femur appeared to be a broken femur, regardless of the presence or absence of witnesses to the event, and healing took place comparably in all.

Secondly, a consideration of the environmental elements that contributed to known isolated traumatic episodes within homes resulting in a single anatomic injury emphasized three prime factors forming zones within a gradient rather than well-circumscribed divisions. Most important numerically was the characteristic lack of self-equilibration and the unpredictable directions of locomotion assumed by all during the various stages of infancy. Experience both as physicians and parents leads us to doubt whether a child ever reaches his second birthday without at least one tumble of sufficient force, potentially, to injure a bone; what determines which of the many who fall from the bed will sustain a fracture involves physical laws beyond our ken. Next in importance was a variety of circumstances that, in reality, merely exaggerate the opportunity for injury and can be pooled into what might be called the unprotective environment. Parental indifference, ignorance, preoccupation with a multiplicity of other duties, alcoholism, relegation of control to irresponsible children or adults, and impossible physical equipment or surroundings all contributed a part. Finally, immaturity, manifested by uncontrolled aggression on the part of either parent or other custodian, and overt psychotic or psychoneurotic behavior by the same group of persons played a much larger role than we initially had assumed. An example of the distribution of these factors is provided by data drawn from 25 consecutive babies admitted with the provisional diagnosis of acute subdural hematoma, with or without fracture. Ten were placed unequivocably in the first category; there was an immediately volunteered story of a fall with no earlier accident, and, in the majority of instances, follow-up is available, which reveals no further trouble. Eight were assigned to the second group, since at least one of the predisposing factors of the unprotective environment was operating; the transitional zone is indicated by two of these where usually cautious parents allowed temporary custody to be assumed by older but irresponsible sibs. The remaining seven fell into the last group, of which two were attributable to postpartum psychosis and a third to an obsessional dislike by the mother for the individual child; the remainder were results of intemperate but isolated aggressions.

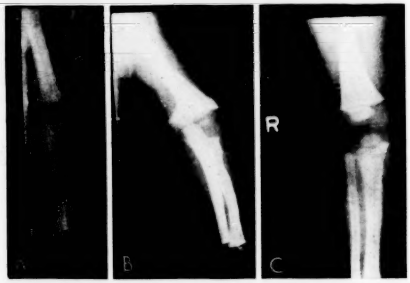

Fig. 1.—*A* (case 2), extensive fragmentation about elbow and wrist with large calcifying hematomas and callus formation. Note fracture of ulnar shaft. *B* (case 2), same elbow as depicted in *A*, three months later. No new lesions and solid healing with moderate deformity. *C* (case 3), note especially the fracture of the medial condyle of the tibia.

Finally, there was no consistant evidence to suggest wide variation in bone fragility among infants. The usual more or less easily recognized syndromes that predispose to loss of skeletal continuity—osteogenesis imperfecta, osteopetrosis, extreme rarefactions accompanying biliary atresia and renal disorders, cysts and tumors, and expanded marrow spaces—were all well represented but caused no great roentgenologic or clinical problem in diagnosis. The fact that rickets, scurvy, and congenital syphilis each was occasionally accompanied by bone impactions and minor loss in continuity constituted but a minimal obstacle since the underlying defect could be delineated by laboratory, clinical, and roentgenologic appraisal. The various osteochondrodystrophies and dysplasias, aseptic necroses, infections, and infantile cortical hyperostosis were sources of but minor confusion. Of all these entities, scurvy presented the greatest point for error because of conflicting views with regard to the manifestations of "subclinical" vitamin C deficiency. The inferences we would emphasize from these statements are, first, that historical data are relative and depend upon the intensity of efforts at elicitation, and, second, that even in freely admitted accidents abnormal behavior by adults is rather common, and finally, that there appears to be little ground in our present concepts of bone pathology upon which to confuse traumatic injury with substrates predisposing to fragility.

Twenty infants in the material studied sustained more than one accident resulting in skeletal or soft tissue damage or presented roentgenologic evidence of bone disruption of such appearance as to necessitate the conclusion that all lesions could not be reasonably ascribed to a single chronological event. Several were merely instances of the various factors comprising the unprotective environment operating over an extended period of time and received no extensive analysis. Others were seen only once or under conditions that did not allow sufficient contact to justify intensive consideration. There remained, after the elimination of these, 12 infants judged to be characteristic of the material presented by the authors mentioned earlier. Each appeared to have had more than one episode terminating in recognizable skeletal change and from none was a story of violence adequate to explain all injuries obtained at the time of first contact. The metaphysial changes emphasized by Caffey and Astley were well represented, while two had definite subdural hematoma, one subarachnoid hemorrhage, and a fourth bloody xanthrochromic cerebrospintal fluid. We were able to maintain contact with each long enough to gain some knowledge of the circumstances surrounding the family constellation. The important data for these are tabulated in the table.

Several features characterize the injury-prone environment illustrated by these summaries. Especially noteworthy is the fact that not a single stable family is represented, and this is most unusual for the type of material seen in our hospital; it will be recalled, for instance, that

of the acute subdural hematomas almost one-half came from households judged stable on the basis of past and subsequent behavior. Emotional instability on the part of one or both parents was the rule rather than an isolated finding when adequate sources of information could be reached, and divorce, either earlier or following our contact with the cases, was commonplace. An extremely important point to be noted is that when these infants were removed from their environments for periods varying from a week to several months no new lesions developed and those that were already present healed at the expected rate. The incidence of injury to tissues apart

Data on Lesions in Twelve Children

Case No.	Age (Mo.), Sex, Color	Skeletal Lesions	Other Injuries	Clinical Summary
1	3, male, white	(a) Healing fractures, right clavicle, 7th and 8th ribs (b) More recent fractures, right 4th, 8th, and 9th ribs (c) Older fractures left radius and ulna (d) Recent greenstick fracture, right humerus (e) Metaphysial separation of left femur and calcifying subperiosteal hematoma (f) Calcifying subperiosteal blood along right femur	(a) Traumatic orchitis (b) Bruises	First child of highly agitated mother with history of 2 "nervous breakdowns" requiring confinement. All violence denied by father who appeared stable. Lesions progressed toward healing, and no new ones appeared during 1 mo. hospital stay. No medical appointments kept. It was learned later that baby was sent to distant part of state with relatives and subsequent child was offered for adoption at birth
2	6, female, white	(a) Extensive fragmentation about both elbows, shoulders, knees, and wrists with accompanying hematomas (fig. 1*A* and *B*)	(a) Said to have had swelling and ecchymoses earlier	First child of this union; one earlier by mother during previous marriage died in infancy. Definite suggestion of rough handling by mother obtained. Despite extensiveness of damage healing took place with minimal deformity. Parents were divorced soon after patient left the hospital
3	9, female, colored	(a) Greenstick of right fibula (b) Metaphysial avulsion both tibias (c) Fractures 2 terminal phalanges (d) Both humeri—tibia and fibula, right (diaphysial) (fig. 1*C*)	(a) Ecchymosis of ear (b) Hematoma of scalp (c) Bruises of hands and legs	Lesions accumulated over period of a month. Third child of divorced mother who could give no account of injury. Child removed from home for 2 mo. with complete healing and no new defects. Mother's home life readjusted in interim. No further trouble
4	1, female, white	(a) Fracture shaft left tibia (b) Metaphysial fracture, right tibia (c) Multiple rib fractures	(a) Second degree burn on arm (b) Severe hypothermia (c) Probable subdural hematoma on basis of xanthrochromic cerebrospinal fluid containing red blood cells	Admitted as osteomyelitis in shock. Father abusive and described by staff as "definite psychopath." Fleeting interview with mother confirmed role of father. Police assistance requested but family left state before arrest was accomplished
5	4, female, white	(a) Oblique fracture femur (b) Older damage right tibia and fibula	(a) Multiple bruises (b) Subdural hematoma	Father habitually violent; one jail term and later observation period in mental hospital. Mother grossly immature; later admitted to 3 separate outbursts of paternal rage involving baby
6	14, male, white	(a) Impaction of proximal humeral metaphysis, right (b) Old periosteal proliferation, right radius (c) Cortical contusion of left radius and right humerus	(a) Orbital hematoma, later (b) Severe laceration of foot (c) Multiple bruises	Mother depressed and violent during pregnancy subsequent to birth of patient. Father addicted to alcoholic rages. Latter probably responsible for more serious tragedies; former for day-to-day minor trauma. Following last injury family came under police surveillance and promptly left state
7	12, female, colored	(a) Old healed fracture, left femur (b) More recent bone contusion right femur and fracture of left ulna (c) Still later fragmentation of left humeral diaphysis (fig. 2*A*) (d) Recent fracture right tibial diaphysis	(a) Scalp laceration; later convulsion with bruises and lacerations (c) Again laceration of nose (d) Terminally fractured jaw and subarachnoid hemorrhage	Child initially terrified of all hospital personnel, later friendly. Fractures healed well in hospital. Police investigation pointed to mother who was again pregnant and quite disturbed but no action taken. Was dead on arrival at another hospital
8	6, male, colored	(a) Multiple fractures of ribs, bilateral (b) Subperiosteal hemorrhage of both tibias and femora (c) Avulsion fracture right proximal metaphysis of femur (fig. 2*B*) (d) 6 mo. later, fracture shaft left femur	(a) Hematoma of scalp (b) Hemothorax accompanying chest injury	Illegitimate child of withdrawn and secretive divorced mother. Presented a variety of explanations for injuries; none very plausible. Healing of all lesions took place rapidly and follow-up after 2 years revealed no new trouble
9	3, female, colored	(a) Old fractures of right tibial diaphysis and metaphysis on left (b) More recent fragmentation of the metaphyses about both knees (c) Recent fractures of skull	(a) Subdural hematoma	Only child in group to come from boarding home but responsibility difficult to assess since homes had been changed recently. Another child in same home found to have unwitted and unexplained midshaft fractures. No further trouble since removal to new home
10	12, female, colored	(a) Metaphysial irregularities of both humeral diaphyses (proximal) (b) Similar changes of both proximal tibial diaphyses (c) Subperiosteal callus distally on left humerus, same on right femur and right tibia (fig. 2*C*); range of duration for these was estimated as covering from 2 mo. to 2 wk.	(a) Bruises	Illegitimate child of divorced and deserted mother. Denied all rough handling but child had been farmed out to several neighbors periodically. No trouble during follow-up period after readjustment of family circumstances
11	12, male, white	(a) Diaphysial and metaphysial fragmentation about shoulders, elbows, wrists, and knees (fig. 2*D*) (b) Extensive periosteal reactions along shafts of all long bones (c) Fracture, both clavicles (d) Fracture, shaft of left tibia; range of acquisition from very recent to 2 mo.	(a) Multiple severe bruises (b) Lacerations about face	Father denied all trauma, later admitted whipping infant, and after lie detector test expanded statement. Convicted of assault and battery and placed on probation. Infant has progressed well in foster home. Mother's role uncertain since she left state before data could be obtained
12	8, female, colored	(a) Fragmentation both distal tibial diaphyses, left proximal tibial, and both distal femoral	(a) Convulsion after "fall from bed" but cerebrospinal fluid clear 1 mo. later	Illegitimate child of divorced mother; patient was more backward of twins. Mother denied handling infant roughly but was described as completely disinterested and irresponsible. Child placed in care of aunt with healing of all lesions and without development of new areas

from the skeleton is far beyond expectancy; a feature recorded by Astley but largely ignored in his enthusiasm for "metaphysial fragility." Finally, it will be seen that in several instances actual guilt was ascribed in court and the skeletal lesions in these cases varied in no essential detail from those seen in the group as a whole. None of these points conclusively constitutes proof that violence is the sole etiological agent concerned in the production of multiple bone defects (with or without subdural hematoma) resembling those due to known trauma. However, when taken together, they appear to lead one in the direction opposite from that of syndromes postulating unusual fragility.

The types of osseous injury illustrated by these cases are numerous and only a representative sampling are presented pictorially. The significant point to be made is that in each individual patient a wide spectrum of differ-

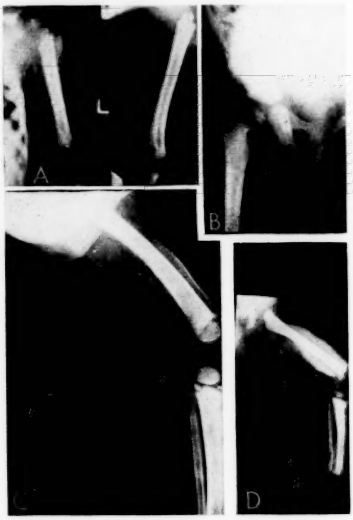

Fig. 2.—*A* (case 7), fragmentation and impaction of the proximal humerus of the left arm. *B* (case 8), avulsion fracture of the proximal femoral metaphysis. This lesion is one of the few that were found about the hips in the entire series. *C* (case 10), metaphysial irregularities and large subperiosteal callus about the right knee. *D* (case 11), fragmentation and extensive callus about all bones of left leg. These also healed without permanent disfiguring.

ent defects was usually found, often ranging from metaphysial impactions through to frank transverse midshaft fractures. The prevalence of metaphysial disruptions in the very young patient suggests this to be a feature of anatomic relationship peculiar to the age span rather than a reflection of specific lines of force or mode of trauma. A study of the case histories provides a fair index to the lines of thought we have pursued with regard to approaching this problem. Initially we made the parents aware we were not satisfied things were entirely peaceful in their respective households and, at the same time, indicated that we were available in a purely nonpunitive role for any help we could provide. Later we attempted to enlist the assistance of various agencies, including the women's division of the police department, in an effort to accelerate investigation, but this was largely abandoned after two families removed themselves rapidly beyond our control and another infant actually died of head injuries while under surveillance. It has become our policy at the moment to attempt by a variety of fortuitous efforts to obtain removal of the child from the household and only then to proceed with investigation of the circumstances surrounding the environment. It is often difficult for the physician to realize that parents have certain legally well-defined rights that cannot be superceded by his opinion or judgment. This appears to be especially true where the aggrieved party is an infant because, obviously, there is no complainant and rarely a witness. We make no pretense in defining the motivating forces leading to aggressive roles against infants. This must be largely left to those who can explain in a wider scope why daily newspapers are filled with accounts of violent deeds involving all age groups. We can point out that earlier emotional instability has characterized several of the parents and that two of the mothers apparently were quite agitated during subsequent pregnancies. It is also interesting that in several of the histories one child has borne the brunt of abuse while siblings have been extended the best of care.

SUMMARY AND CONCLUSIONS

It is rather common to see infants with skeletal lesions that resemble those due to trauma but for which no explanatory history of injury is obtained. These have been recorded in the literature chiefly as two syndromes of unknown etiology; first, chronic subdural hematoma with fractures of the long bones, and, secondly, increased metaphysial fragility of infancy. In an effort to learn more about these states, material seen over an eight year period with roentgenographic findings suggesting injury, with or without a history of trauma, has been appraised. In addition films demonstrating known pathological processes that might be confused with actual fractures have been reviewed, and four broad conclusions are drawn. 1. A history of injury in any clinical category of skeletal damage may be readily obtained, elicited only with difficulty, or not confirmed at all. There are no roentgenologic criteria for classifying cases on the basis of a presence or absence of a valid story for violence. 2. The general environmental factors surrounding infants who suffer osseous discontinuity range from "unavoidable" episodes in stable households, through what we have termed an unprotective environment, to a surprisingly large segment characterized by the presence of aggressive, immature, or emotionally ill adults. 3. There is little evidence, clinical or roentgenographic, supporting belief in unusual fragility of bone as an entity during infancy, or of any peculiar association between subdural hematoma and increased skeletal fragility. Little evidence was found for confusion between various recognized clinical states leading to a hypothetic increased tendency to fracture and the multiple skeletal defects that appear grossly to be due to unrecognized trauma. 4. A study of 12 infants presenting multiple areas of bone damage, which appeared to have accrued over an extended period of time and for which no easily elicited story of injury

was available, shows that they came invariably from unstable households with a high incidence of neurotic or frankly psychotic behavior on the part of at least one adult, and we have termed such situations injury-prone environments. When these infants were removed from such surroundings and treated as if their defects were due to adverse stresses, healing took place promptly and new lesions did not develop. The incidence of injury to tissues apart from the skeleton was much higher than would be expected fortuitously, and these injuries included four examples of intracranial bleeding as well as several contusions, lacerations, and hematomas of the scalp without evidence of deeper pathology. It is difficult to avoid the over-all conclusion that skeletal lesions having the appearance of fractures—regardless of history for injury or the presence or absence of intracranial bleeding—are due to undesirable vectors of force.

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PARALYSIS OF VOCAL CORDS FOLLOWING THYROIDECTOMY

A STUDY OF ITS ASSOCIATION WITH HYPOTHYROIDISM AND HYPOPARATHYROIDISM

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There are a significantly large number of individuals who develop vocal cord paralysis due to injury to the recurrent laryngeal nerve at the time of thyroidectomy. One of us (P. H. H.)[1] has reported that unilateral paralysis occurs in 1.5 to 15% and bilateral paralysis in less than 1% of patients in whom thyroidectomy has been done. Feuz [2] reported a series of 250 patients examined carefully, before and after operation, with 7.6% incidence of organic paralysis due to the operation. In a series of 3,000 thyroidectomies, Lahey and Hoover [3] found that by routine dissection and demonstration of the recurrent laryngeal nerves in thyroid surgery he had lowered the incidence of nerve injuries in three years from 1.6 to 0.3%. In a series of 504 patients, Mulligan [4] reported that 32 patients, or 6.3%, incurred injury to the recurrent laryngeal nerves. The recurrent laryngeal nerve had been identified by the surgeon at operation in only 2 of these 32 patients in whom the nerves were injured. Unilateral paralyses occurred in 24, or 4.7%, and bilateral paralyses in 8, or 1.5%, of this entire group. There has been no definite correlation of the frequency with which thyroid and parathyroid deficiencies occur in association with vocal cord paralysis, although they are well-recognized complications of thyroid surgery. The available statistics on these situations without reference to laryngeal nerve paralysis following thyroidectomy also have not been uniformly consistent (table 1).

INCIDENCE OF COMPLICATIONS OF HYPOTHYROIDISM AND HYPOPARATHYROIDISM

Without reference to vocal cord paralysis, Bartels [5] reported on 2,400 patients subjected to thyroidectomy. The incidence of postoperative myxedema was determined in the first 1,000 patients, of whom 942 were followed. There were 69 cases of postoperative myxedema, making an incidence of 7.3%. In his series, 1.3% were classified as having transient myxedema and 5.2% permanent myxedema. Tetany was reported to have developed in 70 of 2,300 patients, or an incidence of 3%. Permanent tetany was considered to be present in only 0.69%. Tetany combined with myxedema was present in 7% of his patients. Other reports have been scanty and varied. Wilson and Mayo [6] in a series of more than 15,000 thyroidectomies found myxedema in 1.2%. In 300 cases reviewed by Nafe,[7] he classified three types of hypothyroid patients: (*a*) patients who were definitely myxedematous, representing 1% of the 300 cases; (*b*) patients who became definitely hypothyroid, representing 6% of the cases; and (*c*) patients with rather indefinite symptoms of hypothyroidism, in whom the incidence was difficult to ascertain. He indicated there were various degrees of hypothyroidism and that the lesser degrees might often be overlooked. In 1937, Swinton [8] stated that the incidence of postoperative hypoparathyroidism was no greater than 1.5% in some large clinics and as low as 0.5% in others. Lachmann,[9] in a comprehensive clinical study completed in 1941, reported 12 of 188 patients, or 6.3%, developed postoperative hypoparathyroidism following thyroidectomy.

ASSOCIATION OF HYPOTHYROIDISM AND HYPOPARATHYROIDISM WITH VOCAL CORD PARALYSIS

Of the complications of thyroidectomy, it seems, from the statistics previously cited, that hypothyroidism occurs fairly frequently, hypoparathyroidism less often, and cord paralysis least often. In the present 100 patients with cord paralysis, there were 31 with hypothyroidism and 16 with hypoparathyroidism (table 2). Patients with bi-

From the departments of internal medicine and otolaryngology, College of Medicine, University of Illinois, and St. Luke's Hospital.

1. Holinger, P. H.: Bilateral Vocal Cord Paralysis Complicating Thyroidectomy, J. Omaha Mid-West Clin. Soc. **6**: 25-26 (Jan.) 1945.

2. Feuz, J., quoted by Durward, A.; Joll, C. A., and Riddoch, G: Discussion on Laryngeal Paralyses, Proc. Roy. Soc. Med. **28**: 201-210 (Dec.) 1934; J. Laryng. & Otol. **50**: 447-460 (June) 1935.

3. Lahey, F. H., and Hoover, W. B.: Injuries to Recurrent Laryngeal Nerve in Thyroid Operations: Their Management and Avoidance, Ann. Surg. **108**: 545-562 (Oct.) 1938.

4. Mulligan, E. J.: Prognosis of Laryngeal Paralysis Following Thyroidectomy, Arch. Otolaryng. **35**: 732-734 (May) 1942.

5. Bartels, E. C.: Hyperthyroidism—Evaluation of Treatment with Antithyroid Drugs Followed by Subtotal Thyroidectomy, Ann. Int. Med. **37**: 1123-1134 (Dec.) 1952.

6. Wilson, W. D., and Mayo, C. W.: Postoperative Myxedema, Surgery **7**: 117-121 (Jan.) 1940.

7. Nafe, C. A.: Metabolic Disturbances Following Thyroidectomy, West. J. Surg. **48**: 253-260 (April) 1940.

8. Swinton, N. W.: Postoperative Parathyroid Tetany, New England J. Med. **217**: 165-169 (July 29) 1937.

9. Lachmann, A.: Hypoparathyroidism in Denmark: Clinical Study, Acta med. scandinav., supp. 121, pp. 1-269, 1941.

lateral cord paralysis also had thyroid and parathyroid deficiencies more than twice as often as patients having only unilateral cord paralysis.

It is noted that hypoparathyroidism, as an isolated manifestation, did not occur in a single patient with a unilateral cord paralysis and in only two with bilateral cord paralysis (table 3). The frequency of the combination of hypothyroidism and hypoparathyroidism is increased from 3 cases (8.1%) in unilateral to 11 cases (17.6%) in bilateral cord paralysis. It would appear that a simultaneous injury to one recurrent laryngeal nerve and the parathyroids on the same side is compensated by the intact parathyroids on the other side.

TABLE 1.—*Hypothyroidism and Hypoparathyroidism Complicating Thyroidectomy*

	Hypothyroidism or Myxedema, %	Hypoparathyroidism, %	Hypothyroidism Combined with Hypoparathyroidism, %
Without reference to vocal cord paralysis *	1-7	0.5-6.3	7
With vocal cord paralysis †	31	16	14

* Statistics as quoted in the literature.
† As obtained in this series.

W. P. Work [10] has reported that postoperative paralysis of the recurrent laryngeal nerves associated with thyroidectomy occurs in a ratio of 7.4 females to 1 male. Our series includes 90 females and 10 males with vocal cord paralysis, a ratio of 9 to 1. This is a greater sex ratio than might be accounted for by the more frequent occurrence of surgery for goiter in women. In a study of 1,810 cases of exophthalmic goiter and hyperthyroidism in the Chicago area, W. O. Thompson and J. H. Means [11] found the sex ratio to be four females to one male. In the present group, four males had bilateral vocal cord paralysis. In 1 of the 10 male patients hypothyroidism and hypoparathyroidism were present. The other nine male patients had vocal cord paralysis but no glandular involvement. Lachmann [9] noted the striking fact that postoperative

TABLE 2.—*Hypothyroidism and Hypoparathyroidism Occurring with Vocal Cord Paralysis Following Thyroidectomy*

Condition	No. of Cases	Hypothyroid	Hypoparathyroid
Unilateral cord paralysis	37	6 (16.2%)	3 (8.1%)
Bilateral cord paralysis	63	25 (39.8%)	13 (20.6%)
Total	100	31 (31%)	16 (16%)

hypoparathyroidism was far more common in women than men. Of 56 cases of hypoparathyroidism that he had seen, only one man was included in his group. The sex ratio of postoperative myxedema has been reported to be 1.8 women to 1 man,[6] when not correlated with regard to vocal cord paralysis. When those patients are considered in whom vocal cord paralysis was accompanied after operation by deficiencies of the thyroid and parathyroid gland, there is a striking predominance of these complications occurring in women. No satisfactory explanation for this predominance is proposed; however, it suggests the operation of some factor other than chance numerical distribution dependent upon the patients' requiring surgery to the thyroid gland.

10. Work, W. P.: Paralysis and Paresis of Vocal Cords: Statistical Review, Arch. Otolaryng. **34**: 267-280 (Aug.) 1941.

11. Thompson, W. O., and Means, J. H.: Comparison of Exophthalmic Goiter in Boston and Chicago: With Special Reference to Iodine Reaction, J. A. M. A. **99**: 1483-1489 (Oct. 29) 1932.

12. Wiggers, C. J.: Cardiac Adaptations in Acute Progressive Anoxia, Ann. Int. Med. **14**: 1237-1247 (Jan.) 1941.

MECHANISM OF SYMPTOMATOLOGY

In addition to the laryngeal impairment, disabilities may result from hypoxia, low metabolism or myxedema, and/or hypoparathyroidism.

Hypoxia.—The symptoms of hypoxia rarely closely follow the operation but rather appear gradually. There may be no manifestations other than voice changes for six months after thyroidectomy. In some cases, years may elapse before serious disability presents itself. The symptoms are generally manifested by the progressive limitation of the individual's activity, resulting from pulmonary and circulatory involvement. Bouts of acute respiratory obstruction are noted in some instances after an episode of mental stress and, in others, in association with nasopharyngeal or pulmonary infections to which these patients are particularly susceptible. When the obstruction becomes sufficiently acute, an immediate tracheotomy must be performed to relieve the hypoxia and to protect the circulation. This is necessary because anoxia with its depressant effect on the myocardium can create a circulatory crisis to the extent of congestive heart failure.[12] This heart failure imposes a most serious problem in an already handicapped patient.

TABLE 3.—*Hypothyroidism and Hypoparathyroidism Occurring Separately and with Laryngeal Nerve Paralysis Following Thyroidectomy*

Condition	No. of Cases	Hypothyroid (Alone)	Hypoparathyroid (Alone)	Hypothyroid with Hypoparathyroid
Unilateral cord paralysis	37	3 (8.1%)	0	3 (8.1%)
Bilateral cord paralysis	63	14 (22%)	2 (3.5%)	11 (17.6%)
Total	100	17 (17%)	2 (2%)	14 (14%)

Marked tachycardia, with or without frank heart failure, characteristically is present, and this may abate dramatically upon the establishment of an adequate airway with tracheotomy. Some of our patients at the time of their thyroidectomy had suffered myocardial damage as the result of their hyperthyroidism, and others had hypertension in association with their toxic condition of the goiter. The preexistence of a damaged heart in these instances, or for any other reason, makes these patients much more easily incapacitated by the slowly progressive hypoxia imposed upon them by the laryngeal obstruction. Continuation of the tachycardia, dyspnea, and cyanosis after tracheotomy should make one suspicious of associated pathological conditions. The effect of hypoxia on the central nervous system is often reflected by the extreme restlessness and apprehensiveness of these patients. Delirium and confusional states may add to the symptoms.

Thyroid Deficiency.—The signs and symptoms of low metabolism or myxedema are readily recognized. The complacent attitude, slowness of response, dull facies, along with the dry skin, marked pallor, coarseness of hair, and poor tolerance to cold, are characteristic and

present a specific picture.[13] They need only be mentioned in passing to stress the significance of their recognition and their identification with patients who have acute respiratory obstructions from vocal cord paralysis. The myxedematous heart becomes inefficient and may fail to meet the increased amount of work it is expected to perform. This ensues from the need for increased peripheral blood flow, resulting from interference with oxygenation. The myxedematous heart that is capable of work comparable to the needs of low metabolism is incapable of carrying this increased work load.

The total body metabolism is accelerated above that which the thyroid-deficient individual is able to cope with. This accelerated metabolism is contributed to by the associated infection, hypoxia, heart failure, and the anemia and edema that may accompany myxedema. The edema of hypothyroidism may include the vocal cords and the supporting tissues of the larynx and thus increases the symptoms of obstruction. The relief of the laryngeal edema with proper thyroid therapy is necessary before major surgical repair of these tissues is undertaken.

Parathyroid Deficiency.—The symptoms dependent upon hypoparathyroidism may be masked by the conditions already referred to. Not infrequently the diagnosis is not made for this reason. When there are unexplainable symptoms, or when vague symptoms of fatigue, muscular weakness, and paresthesias are present in persons in whom thyroidectomy has been done, the patient should be examined for the signs of disturbed calcium and phosphorous metabolism. Depending upon the degree of hypocalcemia, there may be cramps of the extremities, carpopedal spasm, laryngeal stridor, and generalized convulsions.[14] Not uncommonly, the condition of some of these patients is improperly diagnosed as psychoneurotic. The cardiac conduction disturbances relating to calcium metabolism are well recognized. Calcium is essential to proper cardiac contraction. It has long been known that prolongation of the Q-T interval in the electrocardiogram occurs when the serum calcium level is low.[15] In the presence of a damaged heart, whether due to preexisting organic heart disease, hypoxia, myxedema, or a combination of these factors, the changes of conductivity and contractility due to hypocalcemia assume greater importance. It would not be expected that complete recovery would occur in these hearts without correcting the low calcium values. In some instances these associated changes act as a trigger mechanism in initiating or prolonging heart failure.

DIAGNOSIS

Vocal Cord Paralysis.—Diagnosis of vocal cord paralysis is easily made by a single mirror examination of the patient's larynx. During the immediate postoperative injury to the cord there may be no subjective symptoms other than hoarseness or huskiness of the voice. In unilateral paralysis the voice is frequently hollow in character, and this may persist, but there is no appreciable respiratory obstruction.. These patients may complain of choking or coughing upon swallowing because of aspiration of food. The voice of the patient with a bilateral cord paralysis is usually much better than that of the patient with a unilateral cord paralysis. There is usually gradual clearing of the hoarseness over the period when paralytic contracture is developing that will finally account for the obstructive symptoms. This usually takes about six months. The cords are then found drawn to the midline on mirror examination. A failure of the cords to separate during inspiration establishes the diagnosis. The voice is almost normal, but each sentence is interrupted by a long, stridorous inspiration, sometimes quite soft but always distinctly noticeable. Upon exertion, or when the patient is asleep, inspiration is accompanied by an extremely loud, alarming stridor. There is then imminent danger of severe obstructive dyspnea. Often a respiratory infection is the precipitating factor and hypothyroid and hypoparathyroidism contributing factors.

Hypothyroidism.—When thought of as a frequent possibility complicating laryngeal obstruction after thyroidectomy, hypothyroidism or myxedema is recognized from the history, symptoms, and characteristic clinical appearance when present. A basal metabolic rate cannot be relied upon because of the difficulties related to the laryngeal obstruction or tracheotomy. The diagnosis is supported by the findings of a high blood cholesterol level and electrocardiographic changes showing a bradycardia, if present, low voltage of all complexes, and flattening or inversion of the T waves. X-ray demonstration of a ham-shaped configuration of the cardiac silhouette is also helpful. If time and facilities permit, tests to determine if a decreased serum protein-bound iodine level and diminished radioactive iodine uptake exist will aid materially in establishing the presence of thyroid deficiency.

Hypoparathyroidism.—The demonstration of neuromuscular hyperirritability by means of the Trousseau, Chvostek, and Erb signs and the finding of a low serum calcium and high phosphorus level substantiate the suspected diagnosis of parathyroid deficiency. The prolongation of electrical systole in the electrocardiogram beyond the duration expected for the heart rate supports the diagnosis.

THERAPY

Heroic measures are sometimes needed at first to tide the patient over. The most urgent consideration is that of tracheotomy for the immediate relief of the respiratory obstruction and to insure an adequate airway. The necessary studies for a complete understanding of the problem can then be carried out under more satisfactory conditions. Management is directed toward correcting the existing deficiencies and preparing the patient for the surgery to follow; this may require one to four months.

Digitalization, oxygen therapy, salt restriction, and diuretics are necessarily included in the management of those patients having congestive heart failure. The failure of the myxedematous heart, however, cannot be overcome by these measures alone. It may be that a combination of circumstances contribute to the heart failure, but, when myxedema is one of these factors, thyroid administration along with the other therapy for the cardiac condition is essential for complete recovery from the failure. Caution, however, in the use of thyroid should be exercised to

13. Means, J. H.: The Thyroid and Its Diseases, ed. 2, Philadelphia, J. B. Lippincott Company, 1948, pp. 133-139, 221-233.

14. Albright, F., and Reifenstein, E. C., Jr.: The Parathyroid Glands and Metabolic Bone Diseases, Baltimore, Williams & Wilkins Company, 1948, pp. 28-33.

15. Carter, E. P., and Andrus, E. C.: Q-T Interval in Human Electrocardiogram in Absence of Cardiac Disease, Society Proceedings, J. A. M. A. **78**: 1922 (June 17) 1922.

avoid an aggravation of the cardiac status. This is especially true in those patients having associated coronary sclerosis with their myxedema. In some instances it is necessary to begin with as little as ⅛ grain (8 mg.) of thyroid extract daily. These smaller doses can then be gradually increased to maintenance dosage over a period of several weeks. The average maintenance dosage is about ½ to 1 grain (30 to 60 mg.) of desiccated thyroid extract daily.

If, incorrectly, the role of the thyroid is not appreciated, not only may the patient fail to improve but harm may be done. Morphine, or its derivatives, which are used widely in heart failure, should not be used or used only in very small dosages because of the extreme sensitivity these individuals have to morphine. This fact must be kept in mind not only in consideration of cardiac dyspnea but also in consideration of preoperative sedation. In addition to the beneficial effect on the heart and circulation, the administration of thyroid profoundly affects tissue growth, wound healing, and distribution of body fluids.[16] This is an important factor in relieving the edema of the vocal cords and other tissues and in improving cellular function throughout the body. Satisfactory recovery from the myxedematous infiltration of muscle tissue should be expected for optimum improvement of muscular tone and contractility, as is desired in the reconstruction and repair of the larynx. The correction of the decreased capillary permeability and the anemia of myxedema also improves the operative risk and decreases the hazards. The myxedematous patient's resistance to infection, particularly through the skin, is lowered. For all these reasons, it is important to allow time for the thyroid therapy to become effective.

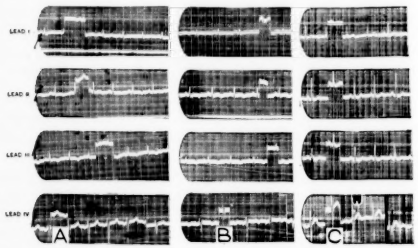

Fig. 1.—*A*, enlarged heart with a ham-shaped configuration (March 16, 1949). On the patient's readmission of May 8, 1949, a suitable x-ray of the chest could not be obtained because of the patient's poor condition. *B*, enlarged heart with some residual pulmonary congestion (July 15). *C*, reversion of heart to normal size, with no pulmonary congestion (Dec. 1).

The benefit derived from elevating the serum calcium level in the presence of the excessive neuromuscular irritability of hypocalcemia is readily appreciated. The use of calcium given intravenously as an emergency procedure when these patients are having acute severe respiratory difficulties, either from laryngospasm or during the immediate preoperative and postoperative periods of tracheotomy and laryngoplasty, is indicated. At other times, when oral medication is feasible, the gradual adjustment of dosage of dihydrotachysterol or vitamin D, as gauged by the clinical response of the patient and serial determinations of the blood calcium and phosphorus levels, aids in correcting the parathyroid deficiency. Use of the urinary Sulkowitch test to maintain satisfactory calcium balance is a simple and effective therapeutic aid in these patients.[17] The correction of the low calcium levels not only controls the neuromuscular irritability and helps relieve the respiratory obstruction but aids materially in correcting the heart failure. Calcium, like digitalis, increases systolic contraction. The cardiac contraction and conduction disturbances relating to hypocalcemia have already been commented on under the section Mechanism of Symptomatology. This is necessarily an important consideration in conjunction with thyroid and specific cardiac therapy.

Much has been written about the additive or potentiating effects of giving calcium intravenously to digitalized patients. In these patients, however, there is a very definite need for intravenously administered calcium, and, when it is administered slowly, it does not produce toxic effects. In the presence of a damaged heart, the toxic effect on the heart muscle of rapidly administered calcium should be kept in mind. When these patients can tolerate food and drugs by mouth, calcium may be used in conjunction with dihydrotachysterol to maintain normal calcium balance. In addition to the hypocalcemia in parathyroid deficiency, there is a rise in serum phosphorus and a decrease in urinary phosphorus excretion, so that methods to diminish phosphorus absorption from the gastrointestinal tract should be tried. Restriction of phosphorus in the diet and the addition of alkali, such as aluminum hydroxide gel, seems to be helpful. Once a regimen for the correction of hypothyroidism and hypoparathyroidism is set up, the patient should be instructed to accept this as a permament part of his life.

The following case serves to illustrate the course and management of a representative case of hypothyroidism and hypoparathyroidism complicating vocal cord paralysis in this study.

REPORT OF A CASE

A 48-year-old woman had had a thyroidectomy in 1920 and a right thyroid lobectomy on June 22, 1941; reoperation was done for suspected adenoma of thyroid on March 18, 1942, and another operation for suspected adenoma of thyroid was performed on May 12, 1948. Hoarseness had been noticed five months after her last surgery and was present for five months preceding her admission on Feb. 22, 1949. Dysphagia, nervousness, and increasingly progressive stridor were the other major complaints. The patient was difficult to manage. She was easily disturbed emotionally, apprehensive, and fearful to be left alone. There was much inspiratory stridor, increasing cyanosis, and dyspnea. Emergency tracheotomy was necessary, after which a pneumonic consolidation developed. The patient developed cardiac decompensation, although she was confined to bed. Pulmonary edema, a large liver, and edema of the legs were present. The patient insisted on being discharged to convalesce at home. She found it necessary, however, to return some two

16. Harrell, G. T., Jr.: Myxedema, South. M. J. **45**: 113-121 (Feb.) 1952.

17. Albright, F.: Note on Management of Hypoparathyroidism with Dihydrotachysterol, J. A. M. A. **112**: 2592-2593 (June 24) 1939. Barney, J. D., and Sulkowitch, H. W.: Progress in Management of Urinary Calculi, J. Urol. **37**: 746-762 (June) 1937.

months later. X-ray of the chest and the electrocardiogram for this admission are shown in figures 1 and 2. The only other laboratory studies done at that time showed a blood cholesterol value of 362 mg. per 100 cc., a total protein value of 8.1 gm. per 100 cc., and a basal metabolic rate of +4. The thyroid and parathyroid deficiencies had not been recognized, and the patient was allowed to return home on regimen for cardiac disease only.

The patient was readmitted on May 8, 1949. Her complaints on this admission were increasing dyspnea, deep chest pain, increasing leg edema, excessive fatigue, nervousness, and extreme restlessness. During this hospital stay, muscular twitching, a Chvostek sign, and a Trousseau sign were elicited. There had been difficulty in correcting the cardiac decompensation. Generalized edema and marked cyanosis were present. A loud, blowing apical systolic murmur was present. Listed in table 4 are some of the laboratory studies obtained during this hospital admission.

TABLE 4.—*Laboratory Data in Patient with Complications After Thyroidectomy*

Date	Cholesterol, Mg./100 Cc.	Calcium, Mg./100 Cc.	Phosphorus, Mg./100 Cc.	Albumin-Globulin, Gm./100 Cc.	Nonprotein Nitrogen, Mg./100 Cc.
During Hospitalization					
5/16/49	535	7.3	...	.....	....
5/18/49	562	Thyroid and parathyroid replacement therapy started			
5/23/49	...	5.9	...	3.2-3.4	38.0
5/27/49	...	7.2	5.3	.....	....
6/ 1/49	...	8.8	...	.....	....
6/ 9/49	...	10.6	...	.....	....
7/ 1/49	365	9.7	...	.....	....
7/15/49	326	....	...	.....	....
7/17/49	378	....	...	.....	....
8/ 2/49	292	10.7	3.7	.....	....
During Outpatient Visits *					
11/12/49	298	11.0	2.3	4.5-3.5	40.5
12/12/49	316	10.3	2.8	.....	43.5
12/29/49	322	9.0	2.2	.....	31.0
4/18/50	287	15.3	2.9	5.7-2.2	47.0
8/ 8/50	418	10.5	1.9	4.5-2.9	42.0
11/21/50	304	12.0	2.4	.....	43.5
4/25/52	430	10.0	3.8	5.6-2.1	....
10/16/52	380	9.6	3.2	5.4-1.8	31.5

* On April 13, 1950, the patient's basal metabolic rate was −14, dehydrochloric acid circulation time 17 seconds, ether circulation time 6.5 seconds, and venous pressure 13 cm.

Further Course.—The patient failed to respond to symptomatic treatment. The heart failure did not correct itself in spite of digitalization, use of an oxygen tent, administration of ammonium chloride for diuresis, bed rest, sedation, and low-salt diet. In fact, as can be seen in comparing the chest x-rays of March 16, 1949, and July 15, 1949, there would appear to have been an increase in cardiac enlargement. However, steady improvement appeared after the addition of thyroid hormone, dihydrotachysterol, low-phosphorus diet, and aluminum hydroxide gel to decrease the absorption of phosphorus from the gastrointestinal tract. In view of the dramatic change and the continuous improvement, it was felt best to permit the patient to carry on with the management at home until the time when maximal benefit would have been derived from the thyroid and parathyroid therapy, as well as to allow for as complete reversal of the cardiac failure as could be obtained. She was discharged in August, 1949. Laboratory studies made during an outpatient visit on Nov. 12, 1949, showed a cholesterol level of 298 mg. per 100 cc., calcium level of 11 mg. per 100 cc., phosphorus level of 2.3 mg. per 100 cc., serum albumin level of 4.5 gm. per 100 cc., serum globulin level of 3.5 gm. per 100 cc., nonprotein nitrogen level of 40.5 mg. per 100 cc., and phosphorus level per 100 cc. There was no evidence of cardiac failure. The patient was readmitted on Dec. 8, 1949, and a laryngoplasty was performed. There were no complications postoperatively, and the patient tolerated surgery very well. X-ray of her chest and her electrocardiogram reverted to normal, as shown in figures 1 and 2.

Over the past two years the patient has remained essentially free of complaints. She gradually increased her physical activities, being able to assume household duties, and within a year's time after her last hospitalization she was able to work in the garden.

SUMMARY AND CONCLUSIONS

One hundred patients with vocal cord paralysis following thyroidectomy were studied. In these patients, the frequency with which thyroid and parathyroid deficiencies occurred was found to be 31 and 16% respectively. Hypothyroidism and hypoparathyroidism accompanied bilateral paralysis more than twice as often as unilateral cord paralysis. Hypoparathyroidism did not occur as an isolated complication in those patients having only one vocal cord paralyzed. Vocal cord paralysis occurred in a ratio of nine females to one male, although the sex ratio of those patients requiring surgery of the thyroid gland is four females to one male. Glandular deficiencies occurred much more frequently in women than men. Thirty, or 33%, of the 90 women had some degree of hypothyroidism and/or hypoparathyroidism, compared with only one male out of the 10.

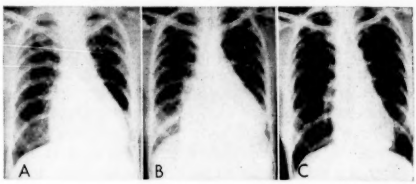

Fig. 2.—*A*, electrocardiogram showing low voltage of all complexes, with flattening and inversions of T waves consistent with myxedema (March 10, 1949). *B*, electrocardiogram of May 10, when compared with that of March 10, shows continued deterioration; no specific therapy had been instituted at that time. *C*, reversion to normal (Dec. 1).

The following suggestions should be considered in management. When a diagnosis of bilateral cord paralysis has been made, an immediate tracheotomy should be performed to prevent a continuation of chronic hypoxia. After relief of the respiratory obstruction, studies that are indicated to diagnose thyroid and parathyroid deficiency should be done. The patient should be studied for deterioration of the myocardium due to nonspecific factors and for presence of hypothyroidism and hypoparathyroidism. When the patient is in a physiologically controlled state, the laryngeal airway should be made adequate for his requirements.

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Physicians as Citizens.—Physicians, as good citizens, possessed of special training, should advise concerning the health of the community wherein they dwell. They should bear their part in enforcing the laws of the community and in sustaining the institutions that advance the interests of humanity. They should cooperate especially with the proper authorities in the administration of sanitary laws and regulations.—Principles of Medical Ethics of the American Medical Association, chapter 8, section 1, June, 1954.

THE ROLE OF CYTODIAGNOSIS IN PRECLINICAL CANCER OF THE PROSTATE

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and
J. Ernest Ayre, M.D., Miami, Fla.

The first objective of cancer research is the acquisition of a full understanding of cancer causation in the hope that discovery of causes will lead to knowledge of cure. Until this objective can be reached, however, it is imperative that we, as physicians, make use of all possible means by which a preclinical stage of cancer may be recognized. The tremendous strides made in the past decade in the recognition of preclinical cancer of the cervix [1] have provided the stimulus to explore other organs, i. e., to determine the possibility that cytological methods, properly applied, may enable the recognition of cancer in these tissues before the stage of symptoms and clinical carcinoma. We have studied the prostate using cytology as an investigative tool, and our results [2] indicate that preclinical cancer of the prostate is a recognizable entity when this valuable technique is effectively applied.

Preclinical cancer of the prostate is defined in this paper as characterized by the morphological features of malignancy existing in the prostate, while the disease is not yet recognizable as such by the examining finger. It embraces the pathological conditions termed occult carcinoma, latent carcinoma, carcinoma in situ, and early infiltrating cancer of the prostate not clinically detectable or anatomically located in a portion of the prostate accessible to the examining finger. Even where there is variation in size, shape, and consistency of the gland in early cancer, it is still difficult for the clinician to recognize the disease as "digital" cancer.

Occult carcinoma is defined by Rolnick [3] as a carcinoma that may be present in the prostate gland and remain localized for many years without activity or spread and, although the sections may show evident histological changes of carcinoma, the tumors may not act biologically as carcinoma. Many investigators have reported figures from 15 to 40% of the male population over the age of 45 years with occult carcinoma of the prostate. Labess [4] reported that occult carcinoma within benign hypertrophy of the prostate gland is not uncommon. In 9 of 98 suprapubic operations for clinically diagnosed nonmalignant enlargement of the gland, malignant tissue was found by histological study. Finkle,[5] reporting on urinary tract infection and prostatic calculi, states: "all the prostatic cancer coexisting with calculi were undiagnosed pre-operatively, the finding of unexpected carcinoma [being] 14.18 per cent. . . ." Herbut [6] states: "the incidence of occult carcinoma, that is, carcinoma undetected clinically or grossly and discovered only microscopically, varies apparently according to the meticulousness with which the gland is examined."

It is established that cancer of the prostate may infiltrate adjoining organs,[7] with the prostate remaining normal to the examining finger. Also, there have been cases reported of body metastases with normal prostatic gland by digital examination.[8]

Edwards and associates [9] use the term "latent carcinoma of the prostate" to describe the small prostatic cancer that remains confined entirely to the prostate and gives rise to no clinical manifestations during life. They also state: "with a rising life expectancy among the population at large, these lesions may in the future attain greater importance. This is especially so should earlier and better diagnostic means become available." The last quotation is a very important one, as we believe that in cytodiagnosis we have available a screening method for early diagnosis. Anderson [10] stated: "cytologic diagnosis of carcinoma of the prostate by rapid fixation of wet smears of prostatic fluid or urine after digital massage is becoming more popular. Whereas early investigators considered the procedure highly unreliable, more experience has resulted in a greater degree of accuracy so that recent reports on this diagnostic procedure are quite convincing."

It has been demonstrated that the male hormone is necessary for continued growth of prostatic cancer, and it has been postulated that androgens are necessary for "initiating" prostatic carcinoma.[11] This is important, as it is rather common for men over the age of 45 years with subjective symptoms of a male climacteric to be given a therapeutic test by the use of androgens. If this is the situation, then we believe that, prior to the administration of androgens, a clinical evaluation of the prostate should be made and all available tests done to rule out the presence of a preclinical cancer of the prostate. In this situation, a simple test such as cytodiagnosis of the prostatic material would be of great aid in removing any doubts or anxiety arising from the use of androgens.

A simplified technique for prostatic cytodiagnosis [2a] has been described as an office procedure, easily performed by all physicians. Simplicity is a significant feature of the prostatic smear. There is a definite technique by which the prostatic fluid should be expressed from

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11. Baker, R.: Studies on Cancer Prevention in Urology: Prostate, Ann. Surg. **137**: 29-35, 1953. Van Buskirk, K. E., and Kimbrough, J. C.: Carcinoma of the Prostate, J. Urol. **71**: 742-747, 1954.

the prostate to insure a representative prostatic cell population. The seminal vesicles must be avoided in the massage, as the spermatozoa obscure the prostatic cells and impair interpretation of the cells. Each lobe should be massaged separately from the periphery toward the midline and then stripped down the middle. The prostatic material should be allowed to flow directly on to a slide. This slide must be prepared properly prior to the massage. It is frequently desirable to advise the patient to hold the slide directly under the meatus during massage, as in some cases there is only one drop, which may fall to the floor. The urethra is stripped starting far back in the perineum in order to move the prostatic fluid forward for collection of cells on the slide. If, after massage and stripping, there is no fluid obtained, the first 10 drops of urine may be allowed to flow onto the previously prepared slide. (Usually at least a small drop is obtainable, so this procedure is exceptional.)

The presence of pus cells obscures the field, and an effort should be made to treat and eliminate or decrease any infection before cytodiagnosis is attempted. Perhaps the most important single factor in obtaining a satisfactory prostatic smear for cytological study is the necessity of seeing that the cells adhere to the slide. During the process of fixation and staining, the cells are washed off, and the final result often gives too few cells for study. This difficulty is overcome as follows: The slide is always prepared with a thin film of Meyer's albumin (equal parts of egg albumin and glycerin) before the expressed prostatic fluid is allowed to flow on to the slide. One of us (J. E. A.) has used slides completely frosted on one side. The slight roughening of the frosted slide increases the number of cells adhering to the slide. After mounting with Canada balsam, the preparation is clear and transparent. Drying produces distortion of the cells, and not more than 30 seconds should elapse between the time the prostatic fluid is placed on the slide and immersion of the slide in the fixative. Many times all the above precautions have been taken and the report will show no cells for study. This is sometimes caused by the fact that, despite a large amount of fluid expressed, the fluid may be completely acellular. Repeated massages will usually demonstrate adequate cells for interpretation. At this writing, there is a serochemical test, still under investigation (Cline method [12]), which will frequently corroborate cytodiagnosis in the detection of preclinical cancer of the prostate.

Many queries have been raised as to how one can get cells from the periphery of the prostate for study. Figure 1 reveals the channels followed by cells desquamated by massage. It is clear that all acini have a connection with an excretory duct; therefore, exfoliated cells can reach the urethra and be detected. Also, it is easy to visualize that cells cannot be obtained if there is a block anywhere along the excretory ducts. In addition, an initial positive report may be followed by negative reports due to blockage. Still further, if the mutated cells proliferate toward the periphery of the gland, then the lesion can be palpated early. It is understandable, however, if the lesion grows concentrically an early palpable lesion would not be the rule.

We have studied 722 cases by cytodiagnosis, and in this series there were 618 patients who had a diagnosis of benign prostatic hypertrophy, prostatitis, and normal prostate. The following chart shows the number of patients with unsuspected cytologically positive cases.

Age	Cytology Grading * IV	V
30-40	0	0
40-50	0	1
50-60	4	3
60-70	8	8
70-80	7	2
80+	1	3
Total	20	17

* Papanicolaou grading.

The question of confirmation has been handled by the use of studies of elevated specific prostatic acid phosphatase levels (Cline method) and tissue sections. The following eight cases illustrate that preclinical cancer of the prostate can be detected by cytodiagnosis. The photomicrographs shown in figure 2 reveal the types of cell studies involved.

REPORT OF CASES

CASE 1.—A white male, aged 51, presented himself for a routine yearly physical examination. He offered no complaints. Physical examination and laboratory studies were normal. The prostate was of a most unusual type. The left lobe was normal. The right lobe, however, seemed to be filled with a firm mass that extended up and involved the lower portion of the seminal vesicle on this side. Prostatic massage was done, and the prostatic material was studied cytologically. A class V, positive for malignancy, report was received. A leading urologist was consulted, who likewise collected a prostatic secretion, from which a paraffin cell-block was prepared at a local hospital. This was examined by a pathologist, who made a diagnosis of cancer, thus confirming the cytological diagnosis. At this time, a serochemical test (Cline) was done, and an elevated specific prostatic acid phosphatase level was reported, denoting that the lesion discovered cytologically was biologically active. The patient was given estrogen therapy and a bilateral orchiectomy performed.

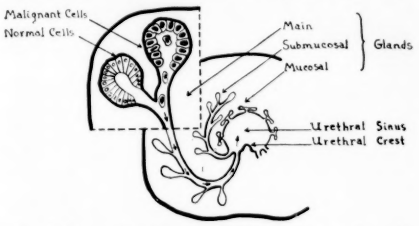

FIG. 1.—Cross section of prostate gland, showing cancer cells reaching urethra and showing how exfoliated cells can be obtained by prostatic massage.

CASE 2.—A 65-year-old white male was examined whose only complaint was weakness. Physical examination and laboratory studies were essentially normal. The prostate was small and soft but tender to palpation. The prostatic material was studied cytologically and a report of class V, malignant, was received. A second specimen of the prostatic secretion was collected and sent to a private pathologist for study. He confirmed the first diagnosis, sending a report positive for malignant cells. A serochemical test (Cline) reported an elevated specific prostatic acid phosphatase level. The patient was given estrogen therapy.

12. Cline, J. K.: Further Studies in Detection and Diagnosis of Prostatic Carcinoma, J. Urol. **73**: 384-392, 1955.

Case 3.—A white male, aged 54, was given a routine yearly examination. He had no presenting complaint. His physical examination and laboratory studies were normal. The clinical impression was that he was normal. The prostate was normal clinically. A routine prostatic massage was done; the secretion was studied cytologically and reported as positive. This patient was then seen by a number of urologists, and their opinions were equivocal. Repeated cytology studies were consistently positive. Serochemical tests (Cline) were done repeatedly, and low values were found. One value was higher but on a repeat test was again low. After four months of careful watching, a leading urologist felt that, in view of an equivocal digital examination and repeated positive cytology, a radical prostatectomy was indicated. This was done, and tissue examination revealed adenocarcinoma confined to the prostate.

Case 4.—A white male, aged 65, consulted his physician because of dizziness. Physical examination revealed gallbladder involvement. His prostate was examined, and it was felt that a chronic prostatitis was present, with an indurated border of

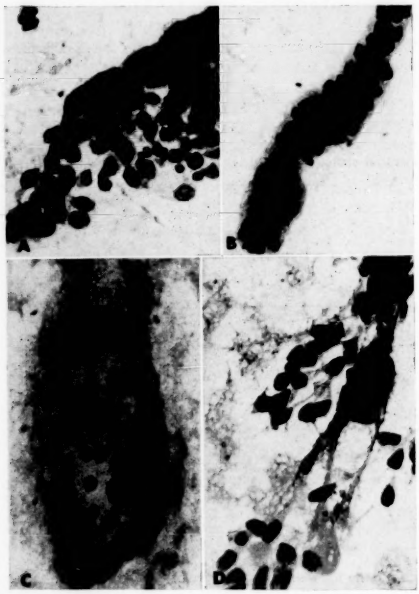

Fig. 2.—Photomicrographs depicting cell studies leading to a cytodiagnosis of malignancy. *A*, dense cluster of cells, with the cells at the periphery showing prominent nucleoli, little cytoplasm. *B*, cell-cast formation of cells with hyperchromatic nuclei, overlapping and crowding of cells. *C*, loose cluster of hyperchromatic "naked" cells, little cytoplasm evident. *D*, well-shown nuclear detail, with marked variation in size, shape, and chromatin distribution.

the right lobe. His history revealed gonorrhea 30 years previously. A prostatic secretion was sent for cytological study and was reported as inflammatory. Blood taken for a serochemical test (Cline) showed elevated values, and another cytology test was requested. This second cytological study was reported as positive. A review of the first cytological study revealed cancer cells that were missed on the first examination. A perineal biopsy was done and reported as positive for malignancy. A radical perineal prostatectomy was performed, and tissue study revealed adenocarcinoma, confined to the prostate.

Case 5.—A prostatic smear was received for study on a white male, aged 75, with the clinical diagnosis of benign prostatic hypertrophy, recurrent. The cytological report was grade III, suspicious for malignancy. A week later, the patient was admitted to the hospital with the admitting diagnosis of benign prostatic hypertrophy with carcinoma of the prostate. The urological residents noted: "If cancer is present, it is very early." The patient was operated on, and a total perineal prostatectomy was done. A note on the operating report stated: "Even after the prostate was exposed it was not possible to determine, definitely, whether carcinoma was present or not." The pathological report was adenocarcinoma nodular hyperplasia.

Case 6.—A prostatic smear was received for study with the notation that the patient, aged 54, had presented himself for clinical study with the presenting complaint of loss of libido. He had seen pinkish urine on two occasions. Examination of the prostate was described as showing the right side mushy, left lobe hard and enlarged. The cytological report was grade V, malignant. A follow-up report was received with the following note: "I believe cytology has definitely been of value in this case." The patient was referred to a urologist, who reported the tissue on perineal biopsy as "benign nodular prostatic hyperplasia and adenocarcinoma, grade II, showing relatively early infiltrating changes." The patient was castrated and given estrogen treatment, with removal of the gland at a later date.

Case 7.—This case is of special interest, as it demonstrates the necessity of having a high index of suspicion and of employing all available methods to reach an accurate diagnosis. This white male, aged 63, was admitted to the hospital and after examination was discharged as having a personality disturbance. Shortly afterward, he was readmitted with a diagnosis of bleeding peptic ulcer and a possible diagnosis of malignant disease of the stomach. Stomach surgery was performed, and tissue examination was reported as negative. Examination of the prostate while the patient was in the hospital was reported as showing benign prostatic hypertrophy, grade II. Two months later, because of a severe backache, the patient consulted a urologist who was interested in cytology of the prostate. A prostatic smear was received with the accompanying clinical note, "indurated prostate, probable cancer of the prostate." The cytodiagnosis was class V, positive. At autopsy, a short time later, carcinoma of the prostate was reported, with extensive involvement of the soft tissues leading to ureteral obstruction and uremia.

Case 8.—A white male, aged 71, had routine yearly examinations including rectal examination and clinical evaluation of the prostate. The examination at this time by a urologist interested in cytology led to a prostatic smear with the clinical diagnosis of carcinoma of the prostate in a benign hypertrophy. The cytodiagnosis was reported as class IV, positive, and an accompanying acid phosphatase study showed a slightly elevated value. On the basis of a clinical suspicion of cancer of the prostate and with positive cytological studies, a total prostatectomy was done. This tissue study revealed adenocarcinoma, with infiltration of the seminal vesicle.

It has been repeatedly stated that occult carcinoma varies from 15 to 40% in the male population, which is about 17 million men. This then means that there are 2 to 5 million persons in the United States afflicted with this condition. In the occult stage, by definition, the carcinoma is biologically inactive; however, cells should be detectable by prostatic cytodiagnosis if there is no block in the duct system. The unsuspected cytologically positive cases constitute 6% of the cases studied, which is not inconsistent with the percentage figures of occult carcinoma. Thus, in the presence of a normal gland, the positive cytodiagnosis should serve to alert the physician that mutated cells are present and that further clinical evaluation and corroborative tests should be sought. In this way, any therapeutic intervention will be based on clinical progress and evaluation, and further corroborative tests may indicate that a previously inactive biological lesion discovered by cytodiagnosis has become active and is in need of intervention.

In this study we have used the serochemical test (Cline method) to corroborate our cytological studies and determine the activity of the lesion that was detected by a positive cytodiagnosis. We have 359 clinically normal cases studied cytologically and serochemically. Our results reveal 17 patients, or 4.7%, in clinically normal conditions who had positive cytological tests with elevated specific prostatic acid phosphatase values. This 4.7% plotted against the male population of 17 million aged 45 or over indicates that, in the United States, 699,000 men harbor biologically active cancer of the prostate that could be screened out and treated.[13]

SUMMARY

Cytology, properly applied, can aid in the detection of cancer of the prostate in a preclinical stage. Six hundred eighteen patients clinically normal for cancer of the prostate were screened cytologically by a simple office procedure. Unsuspected positive cytodiagnosis for malignancy was found in 37 cases, leading to further clinical investigation and evaluation.

1155 N. W. 14th St. (Dr. Gunn).

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PREVENTION OF LONG-TIME DEPENDENCE OF POLIOMYELITIS PATIENTS ON TANK RESPIRATOR

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There are probably now in the United States at least 500 patients with poliomyelitis, more or less permanently confined to the tank respirator, widely identified in Europe, as well as in America, by the name of "iron lung." The purpose of this paper is to point out that with skillful and energetic treatment, carried out decisively toward a single purpose, it is almost never necessary for a patient to be confined in such a device indefinitely. All but a very few victims of respiratory paralysis from this disease can be made mobile and free from a tank respirator within a few months, and except for occasional brief periods of aid, can do things for themselves.

Since the invention of the tank respirator by Philip Drinker and others in 1930, this device has come to stand in the public eye as a symbol of poliomyelitis, carrying with it vague feelings of horror as a weird device for desperately sick patients who may recover or die. The vague feeling of horror in the layman's mind is, in the physician's mind, a more precise and definite feeling, the physician having in mind the picture of a person incarcerated in a metal tank and cared for at great cost, under extremely difficult circumstances, for indefinite periods of months or years, or for his life. It is clear to all that those "iron lung" prisoners are for the most part completely prevented from ever going home, from any self-care activity, or any hope of occupational rehabilitation. At the time the respirator was being developed in the early 1930's, a very pertinent question arose as to whether any patient with respiratory paralysis of such a degree as to demand tank respirator care to maintain life could ever become free of the machine. Since, before the invention of the tank respirator, death in the acute stage was usual, previous experience could not answer this question, although, on the basis of observations of other muscle groups, the assumption of some recovery was logical. However, the fear that the respirator patient might live indefinitely in such an abnormal fashion has been borne out by the experience in many hospitals as the machine has become more generally used.

It was the experience of one of us (J. L. W.) during the first decade of use of the respirator that most patients with respiratory muscle paralysis who survived the first two weeks could be freed from mechanical aid in a few months at the most; however, early experience of all physicians with the respirator was much more with children than is true now. There has been a change in the age incidence of poliomyelitis with respiratory paralysis as in the disease in general, so that the majority of patients are now older children or adults. Moreover, many patients in that first decade, which was the period before the development of antibiotics, soon died of pneumonia. Although these factors may in part explain the now vastly greater number of patients chronically dependent on, or "addicted" to the respirator, we do not feel that this tragic situation, encountered in many hospitals in every state in this country, is necessary.

We will summarize briefly our experience particularly since the development of a respirator center at the University of Michigan, where patients chosen for the most part because of chronicity and severity of their involvement could be intensely treated. Of all the patients with respiratory paralysis hospitalized at the University of Michigan during the last four years (over 100), only 2 were not completely weaned from the tank respirator in three months, and these 2 used the machine only part of the time. Since the respirator center was opened three years ago with a maximum capacity of 20, 81 patients have been discharged from it. Approximately half of these patients developed respiratory paralysis on our own contagious service and were under our care almost from the onset of their illnesses. Forty-one were transferred from other hospitals for the predominant reason that they were chronic respirator patients and could not be freed from constant dependence on the machine in the hospital where they had been confined. Ten of these 41

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The Poliomyelitis Respirator Center is aided by an annual grant from the National Foundation for Infantile Paralysis.

patients had been in tank respirators for over one year before transfer, the remainder for periods of four months to one year without apparent hope of relief. On the average, it required three weeks to wean the patient completely from the tank respirator, and some who had been "respirator-fast" for over a year before they were transferred to the University of Michigan respirator center were free from this burdensome dependence as soon as the others. On an average, however, it took us longer to make "respirator-free" those who had been transferred from other hospitals than those who had been under our care during the early course of the disease. It should not be inferred that freedom from the tank respirator always implied freedom from all mechanical aids to respiration. Two-thirds of those who required part-time respirator assistance required use of it only at night. Some could breathe only two hours without mechanical assistance, but these patients derived their additional aid either from a chest respirator where they could carry on other activities besides just breathing or in a rocking bed that they used for the most part for night sleep or short periods of rest in the daytime.

FACTORS IN DEPENDENCY ON RESPIRATOR

Obviously, the biggest factor is the number of irreversibly damaged anterior horn cells that control the respiratory muscles or, as a corollary, the number that are only partially diseased and can recover. This situation is probably almost entirely beyond the control of any present medical regimen and will not be discussed here. A second factor, one that we believe is of great importance, is to a great extent psychological. The fact that many patients with respiratory difficulty due to poliomyelitis learn to demand a far greater pulmonary ventilation than, from observations of normal persons, we have any reason to believe is necessary and in fact develop a respiratory alkalosis, which to them seems a comfortable state, is now well established. Much can be done to prevent this condition or to correct it, once it occurs. A third factor, difficult to understand or treat, is the loss of "pulmonary compliance." This term, which has been devised recently by the physiologists in the Harvard School of Public Health,[1] seems useful, although it has rather vague physiological significance. It indicates a loss of the elasticity or expansibility of the thoracic cage or lungs, so that a greater effort than normal is required to expand the lungs to a certain definite extent. This factor, though poorly understood, can be in part prevented or treated. A fourth factor is again fundamentally psychological. The patient must have a desire to free himself from the tank, and this means that he must have an incentive, a belief that the future holds something for him. The second factor needs considerable discussion, as we think it is crucial in the early care of these patients, when it may be prevented in part or entirely.

Psychogenic Hyperpnea.—We pointed out in a recent publication[2] that, early in the course of respiratory muscle paralysis due to poliomyelitis, there already has developed in many patients a hyperpnea with a demand for excessive pulmonary ventilation, before they have been placed in respirators. In spite of a partial respiratory muscle paralysis, these patients succeed for a short time at least in actually overventilating their lungs. This hyperpnea is sometimes aggravated by care in the respirator, particularly when inexperienced attention is given or when the machine is controlled only by the demand of the patients for relief from respiratory distress. Many patients remain for a long time in a state of respiratory alkalosis, which becomes their only state of comfort. It may well be that this is, more than a psychological problem, a result of some subtle disturbance in respiratory physiology due to the disease. So far, however, it is not clear that this is so, and our success in correcting the condition does not indicate that any inherent fault of the respiratory center, at least after the first days of the acute stage of the disease, is a real factor in causing this abnormal overventilation. It definitely seems to us that respiratory alkalosis is a result of the psychogenic demand for excessive pulmonary ventilation, which actually may antedate the use of the respirator or other artificial aids to respiration, and that the phenomenon is based fundamentally upon a subconscious or conscious fear of respiratory failure. Some short illustrations from two cases may be helpful. The first patient indicates to us that the alkalosis to which a patient in a tank respirator becomes accustomed as a state of comfort to him results from psychological rather than physiological factors, because this patient was "cured" of his alkalosis immediately by a transfer to another type of respiratory aid equipment.

A 24-year-old man was transferred to our center in a tank respirator about nine months after the onset of his illness, during which time he had been dependent on the machine. When he arrived, his machine was running at the rate of 20 cpm at pressures −20 cm. H_2O and +5 cm. H_2O. Those pressures and that rate had been maintained for several months. His minute volume in the machine was between 12 and 13 liters per minute, which we estimate was about twice his expected needs.[3] His arterial pH was 7.59 (expected normal 7.40), and his arterial carbon dioxide tension, as calculated, was 23 mm. Hg (normal 40 mm. Hg) indicating a marked hyperpnea. (The figure for carbon dioxide tension is calculated from standard tables [4] from the blood pH and total carbon dioxide. There is excellent reason to believe that the partial pressure of carbon dioxide in arterial blood [pCO_2] is close to the pCO_2 in alveolar air.) His vital capacity was slightly over 300 cc. (normal mean 3,000 cc.), and his average tidal air in the tank was about 600 cc. The last two items indicate why he was dependent upon the machine. Because his vital capacity was only about half his accustomed tidal air, he became exceedingly dyspneic whenever the machine was opened, but he also became quite dyspneic if the pressure in the tank respirator was turned down even a centimeter or two, a change that could hardly produce a physiologically significant difference. Therefore, his dyspnea must be interpreted as partly, at least, psychological in origin. The day after admission to the respirator center he was fitted with a chest shell, which was able to provide for him a minute volume of about 7 liters and an average tidal air of about 400 cc., a reduction of 200 cc. over his accustomed tidal air in the tank respirator. It should be remembered that he was in an entirely new situation, and, although he was slightly apprehensive in this new device, he did

1. Ferris, B. J., Jr.; Meade, J.; Whittenberger, J. L., and Saxton, G. A., Jr.: Pulmonary Function in Convalescent Poliomyelitis Patients: III. Compliance of the Lungs and Thorax, New England J. Med. **247**: 390-393 (Sept. 11) 1952.

2. Dickinson, D. G.; Wilson, J. L., and Graham, B. D.: Studies in Respiratory Insufficiency: I. Carbon Dioxide and Oxygen Studies in Early Respiratory Paralysis in Poliomyelitis, A. M. A. Am. J. Dis. Child. **86**: 265-272 (Sept.) 1953.

3. Baldwin, E. deF.; Cournand, A., and Richards, D. W., Jr.: Pulmonary Insufficiency: Physiological Classification, Clinical Methods of Analysis, Standard Values in Normal Subjects, Medicine **27**: 243-278 (Sept.) 1948.

4. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company, 1932, vol. 2.

not have air hunger. In other words, he immediately accepted almost a 50% drop in his accustomed minute volume, when it was provided by the chest shell rather than by the tank respirator. A few days later, he was placed upon the rocking bed, which provided a similar minute volume and to which he also quickly became adjusted; however, even after he had used the chest shell and rocking bed during the daytime for three weeks, when he was placed in the tank respirator at night, it was still necessary for us to overventilate him, since immediately on return to the tank respirator he became dyspneic unless his minute volume was up to about 12 liters and his tidal air again to 600 cc. Learning this, we completely discarded the tank respirator after three weeks, using only the chest respirator and rocking bed. At the end of two and one-half weeks, his pH was 7.48 (a significant reduction), his total carbon dioxide was 27 mEq., and his arterial carbon dioxide tension was 37 mm. Hg (all readings almost normal). He has remained since then in chemical balance, with a tidal air of slightly more than 300 cc. (which was about his vital capacity), and, when his tidal requirements came down to this point, he tolerated short periods of unassisted breathing. In the subsequent six months, his vital capacity has risen to about 450 cc. (from 300 cc.), and he now spend three hours at a time breathing by himself and the rest of the daytime with a cuirass respirator, so that he can now occupy himself in a great many other ways.

Another case illustrates a more difficult problem of weaning from the tank respirator. In this patient, the state of alkalosis may have been more necessary physiologically than in the preceding patient. The situation may be described as a biochemical addiction to hyperpnea.

A woman was flown to our center by airplane some 2,000 miles, nine months after developing acute poliomyelitis. During these nine months she had remained in a tank respirator constantly, with the machine running at a rate of 18 cpm at pressures −20 cm. and +5 cm. H_2O. Her vital capacity at the time of admission was about 300 cc. Her initial spirometer tracing, while she was in the tank respirator, at the rate and pressures she had been accustomed to, revealed a minute volume of 13 liters, about two and one-half times her expected requirements. She was in a state of severe respiratory alkalosis, with an arterial pH of 7.63 and a carbon dioxide tension of 22 mm. Hg. Other blood chemical studies revealed no variation from normal. In her case, it was necessary to reduce the pressure in the tank respirator progressively but very slowly so that her minute volume was reduced to about 10 liters per minute, with a tank pressure of −15 cm. H_2O, and 8 liters per minute with the tank pressure at −12 cm. H_2O. At first she was quite uncomfortable if the pressure was reduced below 18 cm. H_2O. In her case the use of the chest respirator and the rocking bed, each device giving about 7.5 liters maximum minute volume, which we felt was enough for her needs, kept her in a state of acute discomfort, so that we could use these machines for only short periods during the first month in our care. During this month, however, we gradually turned the pressure of the tank respirator down until, at the end of that period, we were using −12 cm. and +3 cm. H_2O, and she was quite comfortable in the chest shell and the rocking bed. It took another six weeks, however, for her pH to come as low as 7.46 (still a little high) and her carbon dioxide tension to 32 mm. Hg (still a little low). In six months she was able to breathe by herself eight hours a day, during which time she was taught to do a great many other things for herself.

Reduction in Pulmonary and Thoracic Compliance.—Certainly, there is clearly evident in poliomyelitis patients, and probably in many other diseases (if we studied them) a loss of pulmonary compliance. It takes a greater effort to expand the lung by a unit amount in these patients than in normal individuals. The causes are not clear. Certainly, one reason is the development of muscle spasm, which, although overemphasized in recent years as an explanation of the debility in poliomyelitis, nevertheless exercises a real ill effect. Another probable factor in reducing pulmonary compliance is the development of contractures of connective tissue and fixation of muscles and joints of the thorax. A third reason is in the lung itself and results from the cohesion of the wet respiratory surfaces, which have not been frequently and wholly expanded. We encounter this effect in states of atelectasis, including the initial atelectasis of newborn infants. All of these handicaps can be relieved a little by treatment. Muscle spasms and contractures can be relieved by efforts in the field of physical medicine similar to those applied to other muscle groups, such as heat, massage, and muscle stretching. Another procedure, which is partially effective, is the use of periodic overdistention of the lung. This was advocated years ago as a detail in the use of the tank respirator, where an occasional great increase in the negative tank pressure could produce a sort of artificial sigh. Theoretically, this should aid in overcoming the effect of cohesion of wet surfaces in the lung, as was shown many years ago to be true of the newborn baby with partial atelectasis. Higher than usual negative tank pressures can be attained by wrapping a towel near the end of the hose of a tank-type vacuum cleaner and rhythmically inserting the hose through the sponge rubber arm port of the tank respirator during the negative pressure phase of the cycle. Pressures up to −40 cm. H_2O can easily be attained with this technique, and it is probably not safe to go beyond this point. The vacuum cleaner may also be arranged for use with the blower side connected through a water trap to a face mask so that several times a day the patient can inhale under quite marked positive pressure applied through the mouth. Recently a new "frog breathing" technique has been developed.[5] This is an interesting and useful procedure that certain patients have spontaneously learned and others have been taught. It consists of blowing up the lungs by repeatedly and rapidly swallowing air into the trachea. We will not discuss this surprisingly successful technique here, but, by its use, it is possible to force at least 1,500 cc. of air into the lungs under considerable pressure. We believe that this is often a far more effective way of stretching the chest than are any of the machines for deep breathing. Although our experience and that of others indicates that none of the above techniques will wholly prevent or cure this handicapping reduction of pulmonary compliance, we do believe they are helpful and should be used. Another case illustrates a typical experience in the study of reduced pulmonary and thoracic compliance.

A 36-year-old woman has had respiratory paralysis from poliomyelitis for about four years and has been at home for the past two years using the chest respirator and rocking bed exclusively. Her vital capacity is approximately 150 cc. About four months ago, while in the tank respirator at pressures −25 cm. and +5 cm. H_2O, her average tidal flow was approximately 350 cc., whereas most of our early convalescent patients would have had an average tidal flow of 1,000 cc. with this pressure. Since this patient needs an average tidal breath of about 300 cc. to maintain adequate ventilation, it means that either exceedingly high pressures have to be used in the tank respirator or other respiratory assistive devices have to be more efficient than is usually the case. Her carbon dioxide tension has been significantly elevated between 48 and 57 mm. Hg for the past year. In other words, she has chronic carbon dioxide retention. Even

5. Dail, C. W.; Zumwalt, M., and Adkins, H.: A Manual of Instruction for Glossopharyngeal Breathing, Hondo, Calif., Rancho Los Amigos Respiratory Center for Poliomyelitis, 1955.

though she is comfortable in her cuirass respirator or in the rocking bed, she has not been adequately ventilated by them. It appeared that something had to be done to increase this patient's pulmonary compliance, or return to the hospital and a tank respirator would be necessary to keep her alive. A vacuum cleaner water trap and mask were supplied in the home, and she was instructed to take a series of 10 deep breaths four times daily with the water trap set at –40 cm. H_2O maximum pressure. She did not use the machine conscientiously, and we do not believe the technique was given a fair trial. Two months later her chest was as inelastic as previously. She was then returned to the hospital for two weeks and taught to "frog breathe." She rapidly learned to force as much as 1,700 cc. of air into her lungs in a single "breath." At the present time, her average tidal air for a given pressure differential in the tank respirator has increased by about 40%, and her pCO_2 has dropped significantly, though it is still above normal. It is hoped that continuous and regular use of this technique will be accompanied by a gradual shift to normal respiratory chemical balance along with more adequate ventilation in the chest shell and rocking bed.

Lack of Incentive.—What can we do to create an incentive that will make the patient desire to free himself from the respirator? It is a tragic circumstance that many patients have given up real hope and have retreated to a life almost of infantilism in which there is no great desire to get out of the machine. Often, a great deal must be done to develop an incentive before any effective steps can be taken. What are the incentives that we can honestly offer? Certainly, with some patients it is hard to see how any ultimate life can be satisfactory. Nevertheless, the presence of the patient in an open ward with others who are in a similar state, but who have made progress, is often an incentive in itself. The hope of going home is the greatest incentive of all, and this is a hope that is very real and that is, of course, a major end toward which our efforts are directed. The hope that, even though he may need respiratory assistive devices such as a cuirass respirator, he can do things for himself is a tremendous incentive, and this hope is made more vivid by seeing other patients who are doing such things as feeding themselves or using a telephone. An outline of what can be done in physical and occupational rehabilitation is too long to present in this paper, but the fact that a severely paralyzed patient, although needing respiratory assistance, can go home, sit up, use his hands, feed himself, move around, travel in an automobile sitting up, and though greatly incapacitated, direct home work, or even get a job, makes an honest basis for a very real hope that we can offer to the great majority of patients. This is the driving force behind all our efforts: to make some sort of a satisfactory life out of one that otherwise would be a mere vegetable-like existence as a respirator prisoner.

COMMENT

What in general terms can we indicate as a program to free our patients from such a tragic situation as an unprofitable existence constantly in a respirator, almost always at great expense to a community or hospital? In this paper, as we have indicated, we can outline a plan only in broadest terms. The first step is prevention, and this means that, as soon as possible after the patient is given aid by the respirator (and we believe this aid should be given generously and early before the need is desperate), the operating pressure of the machine or the patient's tidal air should be reduced to a reasonable point as determined by the physician. The patient should not dictate the degree of pressure in the respirator or its rate, though his desires should be considered. As will be described later, the proper regulation of the machine depends partly on clinical observation and partly on certain quantitative physiological measurements. As has been pointed out many times, a great many shrewd clinical observations can be made by the operator of the machine. Particularly in the early stage of the respirator treatment, the physician should study his patient, especially when he is asleep and unconscious of what is being done, by watching for signs of dyspnea as he gradually reduces the pressure in the tank. Although this plan is not as easy as it many first seem, in many patients, particularly in children and particularly when the patients are asleep, it is very easy to reduce "secretly" the pressure slowly, over a period of minutes, to the point where evidence of dyspnea, such as dilatation of the nostrils, use of extra respiratory efforts, or the tightening of the accessory muscles in the neck indicate that more pulmonary ventilation is desired. This observation, however, is of little use in the patient who has already developed the state of physiological imbalance with respiratory alkalosis. In such a patient, one must first learn by certain simple physiological measurements the state of pulmonary function, that is, whether he is actually being overventilated or underventilated. This can be done best, but not most easily, be determining arterial carbon dioxide tension on the dependable assumption that alveolar carbon dioxide is like arterial carbon dioxide or by determination of blood pH and the total carbon dioxide and the calculation of the partial pressure of carbon dioxide. In many hospitals this is impractical to do, as the dependable determination of pH is not an easy procedure to carry out. Another more practical method for many, therefore, is to determine by a simple basal metabolism machine tracing whether the patient's ventilation is in the normal range. (Data about this are readily available.)[3] Only after it has been determined that the patient is breathing normally in the respirator or is overventilating can the operator of the machine determine whether it is necessary or how energetically he needs to try to convince his patient to get along with less pulmonary ventilation. Attempts to urge patients to get along with less tidal air than they have become accustomed to or desire should not be carried out brutally or ill results are likely to follow. A patient of ours illustrates this and is an example of an individual who was removed too abruptly and thus improperly from a respirator. After this patient's transfer to us, we found his vital capacity was in the neighborhood of 325 cc. In the hospital where he was before transfer to us, he was taken out of the respirator and left out entirely until he became exhausted and cyanotic. He was then given oxygen by mask in an effort to increase his endurance and make him free of the respirator. Apparently, it was not realized that the carbon dioxide excretion through the lungs is as important as oxygen supply and that its retention can be disastrous. On two occasions during these periods of unassisted breathing he had become comatose and, therefore, was terrified when he was left out of the respirator for even a few minutes, which made his subsequent care far more difficult. Although we do not have specific measurements of his vital capacity during this period, we feel certain that he was left out hours longer than his vital ca-

pacity justified and was in respiratory acidosis (carbon dioxide accumulation) during the period when he was given oxygen by mask.

The successful care of a respirator patient requires all the skill of a good bedside doctor who is acting as psychiatrist and physiologist, as well as internist or pediatrician. The physician must give the patient a desire to free himself of the machine and must give him confidence that he can succeed. It is necessary to let him see his neighbors with similar illnesses who are becoming free of or who have already freed themselves from the respirator. The patient should compete with others, though not to the point of excessive fatigue, in staying out of the respirator or letting it be run at a lower pressure. Whether the patient should be allowed to breathe 2 hours, 12 hours, or indefinitely, without respiratory aid, should depend upon whether he develops fatigue or whether he is prevented from resting by the efforts of his breathing. Both these signs may develop in a state of respiratory alkalosis in the patient who has become addicted, as it were, to overventilation. In general terms, we can state that no patient should be allowed to breathe for himself until he can provide a minute volume equal to that to which he has become accustomed in the respirator. His vital capacity must be approximately twice his average tidal air requirements before he can be expected to breathe for himself for longer than a few minutes. Beyond this point, the vital capacity may be used as an index of fatigue, the patient being allowed to breathe for himself for as many hours as his vital capacity remains constant and being returned to the respirator when his vital capacity begins to fall.

SUMMARY

It is exceedingly rare that any patient with respiratory paralysis needs to be kept indefinitely in a tank respirator. With skillful energetic treatment and support from rehabilitation techniques, almost any patient can be freed from dependence upon the tank respirator within a few months.

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VALUE OF PSYCHOMETRIC EXAMINATIONS IN MEDICAL DIAGNOSIS AND TREATMENT

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To many people the term psychometric examination means simply an estimation of the intelligence quotient; however, psychological tests as they are administered today ascertain much more than that. This is attested by the fact that there are currently in existence about 800 tests—education, psychological, and vocational. Therefore the problem of selecting the appropriate test that will offer the maximum amount of pertinent information and that will do it most accurately is always present.

Methods of psychometric examination may be divided into two main categories, nonprojective tests and projective tests. Nonprojective tests are primarily designed to evaluate personality traits quantitatively and relative to statistically established norms. These norms have been standardized according to representative samples of the population under consideration. The Wechsler-Bellevue intelligence test, for example, estimates the amount of intelligence a given person has; the Bender-Gestalt test may indicate the presence of organicity and give a rough estimate of its extent in a given psychiatric deviation; the Bernreuter Personality Scale attempts to measure the extent of neurotic tendency, of self-sufficiency, of introversion-extroversion, of dominance and submission, of self-confidence, and of sociability. The Minnesota Multiphasic Personality Inventory (MMPI) purports to show the presence and amount of deviation within an individual in such categories as depression, hysteria, psychopathy, masculinity-femininity, paranoia, psychasthenia, schizophrenia, and mania.

While the nonprojective tests, generally speaking, yield objectively quantitative and comparative information about different aspects of personality, the projective techniques reveal qualitative and subjective differences that give information regarding the way in which the personality is functioning, i. e., the dynamics involved. These tests employ the use of amorphous or unstructured stimuli material. The responses are analyzed in part by comparison with previously established norms, and in part according to subjective evaluation based on the skill and experience of the individual examiner. The responses of the subject to these amorphous or unstructured stimuli are considered to be "projections" of the subject's own personality functioning, which is a result of his past experiences, his present needs, and his basic attitudes. If the test is valid, if the patient is cooperative, and if the examiner is skillful, a fairly accurate and detailed account will be obtained of how the person is using his personality assets and which of his liabilities is hampering his functioning and how they are doing this.

Since the major component of at least half of the conditions for which patients consult physicians involve personality factors, such as intelligence, emotivity, and degree of ego integration, and since diagnosis and prognosis of psychosomatic disorders as well as their treatment are influenced to a large degree by these factors, it seems to us important that the internist be familiar with the use of methods of personality evaluation—psychometrics.

To be sure, it is not intended that the internist or the psychiatrist be adept in the administration of psychological tests. To expect this would be the same as expecting an internist to carry out all of the complicated laboratory

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Dr. Herman J. Wolff, St. Paul, referred cases 5 and 6.

tests that he uses in medical diagnosis, such as biochemical tests, electromicroscopy, and examination of the body fluids. Yet, just as internists and psychiatrists rely on certain diagnostic procedures carried out in the medical laboratory, they may also rely on certain diagnostic tests and procedures carried out by the clinical psychologist. Obviously, it would not be possible within the scope of this article to name more than a few of the tests used by clinical psychologists. Therefore, we will mention but briefly the five basic tests that we have found useful in medical and in psychiatric diagnosis. The first test is the Minnesota Multiphasic Personality Inventory.[1] The second test is the Bender-Gestalt test,[2] which gives a measure of organicity in various psychiatric and medical syndromes. The third is the Wechsler-Bellevue test,[3] which is widely used and has been very helpful in determining the patient's ability to absorb psychotherapy and psychophysiological explanations according to his capacity to learn and to understand. The fourth is the Rorschach (ink blot) test,[4] which we have found to be the most useful of all the tests we use and capable of the widest application. The fifth is the Murray Thematic Apperception Test,[5] which tells much about the patient's personal dynamics. This test is especially useful as a supplement to the Rorschach test and has been of great assistance in working out the dynamics of various psychosomatic problems.

MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

Leverenz [6] used the Minnesota Multiphasic Personality Inventory on a large number of soldiers and concluded that "the test helps materially in disclosing the probable contribution of neurotic components in disturbances that have finally proved to be complex psychosomatic syndromes. One time this may mean that surgical intervention and the more radical procedures are to be avoided, whereas at another time it may result in unusually early recognition of an organic disorder through the presence of a normal profile and the consequent improbability of a neurotic basis for the complaint." We have used this test in a considerable number of cases and are convinced of its applicability and usefulness. Furthermore, it has the virtues of simplicity, ease of administration, and economy of both time and expense. The actual scoring can be done by any intelligent office secretary after a few hours of study and instruction. When the profile is finished the clinician has a measure of the patient's various personality disturbances as well as an indication of their severity. The test is of assistance in indicating borderline conditions and the mixtures of psychotic and psychoneurotic elements, about which definite decisions may otherwise be difficult to make. If the profile is abnormal one may assume that psychic deviations are playing an important part in the clinical picture. The following case report shows the use and value of this test.

CASE 1.—A 50-year-old white male farmer was seen because of lower back pain. Elsewhere a diagnosis had been made of protruded intervertebral disk; however, the neurosurgeon to whom the patient had been referred for treatment was not convinced that the objective findings warranted surgical intervention. Accordingly, he was referred for psychiatric evaluation. During the interview the patient reported that he had been disappointed by the fact that his two sons had not returned to the farm after their discharge from military service. He had built his hopes on expectation of their return and was planning on semiretirement. When the sons decided to go elsewhere the patient was left with the prospect of continuing indefinitely to farm more land than he felt able to handle. He then developed severe lower back pain. As time went on he became apathetic, depressed, lost interest in things, and had a few crying spells.

The attending physician noted a flattening of the lordotic curve of the lumbar spine, some pain on straight leg raising, and an equivocal difference in the ankle jerks, i. e., minimal signs of a protruded disk. Roentgenograms showed a narrowing of the space between the 3rd and 4th and the 4th and 5th lumbar vertebrae. A spinogram was not done. As part of the psychiatric examination a Minnesota Multiphasic Personality profile was obtained, and this showed high deviations in the categories for depression and hypochondriasis. These findings led to more extensive psychiatric investigation, and it eventually was established that the patient's pain was psychogenic in nature and that a spinogram was not indicated. The patient was given psychotherapy and a series of six electroshock treatments, after which he recovered completely.

Case 1 is an example of the use of a simple psychometric test in assisting in a differential diagnosis between a questionable organic lesion with a functional overlay on the one hand, and on the other hand, a psychosomatic disorder. Even if a spinogram had been done in this case and had been reported negative, there still would have been some doubt as to whether this patient's pain was psychogenic in origin. Had the Multiphasic profile been normal, we probably would have proceeded with a spinogram and, eventually, a laminectomy. However, the presence of deviations in the personality profile alerted us to the possibility of a strong psychogenic element, and we felt that, before any other procedures were instituted, psychotherapy was indicated.

BENDER-GESTALT TEST

The Bender-Gestalt test is also used fairly frequently. This is a maturational test in visual motor Gestalt function. Its purpose is to explore loss of function and to evaluate cerebral injury and disease. Gestalt function has been defined by the author of the test as "that function of the integrated organism whereby it responds to a given constellation of stimuli as a whole, the response itself being a constellation, or pattern, or Gestalt." The test material consists of nine patterns first devised by Wertheimer to be used in his research on visual Gestalt psychology. These nine patterns are presented to the subject one at a time, and he is asked to copy them on a sheet of paper. The interpretation of the test results depends in part on the way in which these patterns are reproduced by the subject, but it also takes into consideration the relationship of the reproductions to one another, the spatial background, the temporal patterning, and the general clinical setting. Cases 2 and 3 show the use of this test.

1. Hathaway, S. R., and McKinley, J. C.: A Multiphasic Personality Schedule (Minnesota): I. Construction of the Schedule, J. Psychol. **10**: 249-254 (Oct.) 1940.

2. Bender, L.: A Visual Motor Gestalt Test and Its Clinical Use, edited by L. G. Lowrey, Research Monographs 3, New York, the American Orthopsychiatric Association, 1938.

3. Wechsler, D.: The Measurement of Adult Intelligence, ed. 2, Baltimore, Williams & Wilkins Company, 1941.

4. Rorschach, H.: Psychodiagnostics: A Diagnostic Test Based on Perception, edited by W. Morgenthaler, ed. 2, New York, Grune & Stratton, Inc., 1942.

5. Morgan, C. D., and Murray, H. A.: A Method for Investigating Fantasies: The Thematic Apperception Test, Arch. Neurol. & Psychiat. **34**: 289-306 (Aug.) 1935.

6. Leverenz, C. W.: Minnesota Multiphasic Personality Inventory: Evaluation of Its Usefulness in a Psychiatric Service of a Station Hospital, War Med. **4**: 618-629 (Dec.) 1943.

CASE 2.—A 56-year-old railroad employee, was first seen in December, 1953. He gave a history of having had a mild head injury in February, 1949, which was followed by unconsciousness for one-half hour. There was no evidence of skull fracture. The patient was away from work for four months. He began to have spells of dizziness, nervousness, shakiness, and difficulty in thinking. He lost his appetite. Further interrogation revealed the fact that the patient had been drinking excessively. He had increasing difficulty holding jobs, his interest waned, he became mildly depressed, and his efficiency decreased. He became irritable and was unable to work for three or four months at a time. The patient's sister stated that since the accident he "had not been himself." She stated that he lacked ambition and energy, she corroborated our impression that there was excessive drinking, and there also was information concerning considerable friction between the patient and his wife. The patient wanted to retire from the railroad on a disability pension, but a psychiatrist in another city said that there was "nothing wrong" with the patient and he, therefore, was not given his pension.

Neurological examination showed a bilateral anosmia, bone conduction exceeded air conduction on the right side, there was a tremor of both hands with past pointing in the finger-nose test, the knee jerks were increased to grade three, and the right ankle jerk was reduced. The electroencephalogram was normal. Our diagnosis was possible reactive depression and also possible chronic brain syndrome. The patient was hospitalized at the Miller Hospital Psychiatric Unit, St. Paul, where he was placed on mild sedation, a high vitamin intake, and superficial psychotherapy. The tremulous condition and irritability improved, but he still showed evidence of difficulty in comprehending things. Consequently, we decided to administer some psychometric tests. A Wechsler-Bellevue test and a Bender-Gestalt test were administered, and they indicated that the patient's present abilities were markedly below past achievements, which suggested a lowering of previous mental abilities. Whereas the patient presented an over-all picture of "normal" intelligence, closer study of intersubtest patterns indicated that he probably had a "high average" to "superior" intelligence at one time, and, further, that his present intellectual efficiency was appreciably lower than the "average" levels. The tests also suggested that there was a progressive decline of all intellectual functioning, and particular deficits were noticed in insight, reasoning, organizational ability (synthesis), and retention.

On the basis of the clinical observations and the results of the psychological testing we concluded that the patient was suffering from a chronic brain syndrome and we so reported to the railroad company. Accordingly, the patient was granted a full disability pension that he now enjoys. Had it not been for the objective psychological testing, we may have had difficulty in convincing the railroad that the psychiatrist who saw the patient previously and who reported "nothing wrong" was in error.

CASE 3.—A 62-year-old diabetic man was seen in consultation in August, 1954. The reason for consultation was that he was having dizzy spells. The spells had been coming on at increasingly frequent intervals, they would last only a few seconds to a minute, and they were not accompanied by any other symptoms such as nausea, vomiting, or disturbances in consciousness. The patient's diabetic condition was under control. The neurological examination was negative throughout except for the presence of retinal arteriosclerosis. During the course of our conversation it became quite evident that the patient had difficulty in remembering names. It so happened that he and one of us (G. R. K.) had a number of mutual acquaintances, including people who lived in the patient's neighborhood. It was quite evident that he was having difficulty in remembering the names of his neighbors and many other things that one would expect him to know if he were cerebrating normally. This led to a discussion as to whether or not the patient was experiencing any difficulty in remembering. He then confessed that, although he did not think that anyone else was aware of it, he was having difficulty in remembering names and remembering various details of his business. He is the head of a business employing several hundred people and, whereas he formerly knew each one of his employees by the first name, he now was having trouble recalling their names. Moreover, when he went on shopping trips he would have to make a detailed list of everything he intended to buy because otherwise he would forget what he went after. The patient also kept a card index system in which he filed information pertinent and relative to his business and other affairs. Apparently he has been doing this surreptitiously for some time.

It is well known that cerebral arteriosclerosis occurs more frequently and earlier in persons with diabetes than it does in persons without diabetes. It was evident that there should be some objective quantification of whatever organic deterioration taking place as a result of cerebral arteriosclerosis in the patient. If this man were to continue to operate his large business something should be known regarding his limitations. Accordingly, a Bender-Gestalt test was administered and showed moderately severe organic deterioration.

In case 3 the Bender-Gestalt test was an extremely valuable laboratory test. In working out a long-range program for the patient in case 3 it was highly important that his family and business associates know that he will suffer progressive mental enfeeblement and eventually become mentally incapacitated. We feel that this knowledge substantiated by a psychological test is of equal importance to the fasting blood sugar determination.

WECHSLER-BELLEVUE INTELLIGENCE TEST

The Wechsler-Bellevue intelligence test was first introduced in this country in 1939, and since that time has pragmatically proved itself to be very useful in accurately measuring the intelligence of the adult population of this country. It has particular advantages in that the person's past formal educational background does not interfere much with the test results. It also is designed to compute intelligence quotients according to methods that allow for the expected decline in intelligence with advancing age. The test purports to measure a person's "global" intelligence (that is, his over-all level of efficiency in functioning as a complete organism), along with the configuration of those elements "not entirely independent but qualitatively differentiable" from one another, that compose this global entity. The test consists of 11 diversified subtests. Six of these form a verbal intelligence scale, and the remaining five subtests comprise a performance intelligence test score. These verbal and nonverbal scales then combine to form the full test scale which yields the over-all intelligence quotient for that particular person. The verbal subtests call for abilities in the verbal area, the arithmetical area, and those areas generally considered to hinge on abstract reasoning. They include, in other words, the ability to perceive logical relations and to use symbols. The performance subtests concentrate more on the person's abilities to handle practical situations. These subtests, therefore, call for performance and manipulative abilities. The use of this test is shown in case 4.

CASE 4.—A charming 18-year-old unmarried girl, who came from an extremely wealthy family, was referred to us in January, 1954, because she was having difficulty in "adjusting." She had had difficulty in remaining in school, she had attended a number of expensive private schools but never had quite made the grade. She had been moody and at times difficult to handle. The patient came from a broken family, and it was believed that most of her problems were on an emotional basis and related, in part, to the fact that her father was an alcoholic and her mother had strong psychopathic tendencies. Elsewhere it was suggested that she undergo psychoanalysis. However, before

deciding on a treatment program we felt that certain psychometric investigations should be made, and a Wechsler-Bellevue test showed a full-scale intelligence quotient of 86, which indicated "dull normal over-all intelligence." An examination of the subtest patterning also indicated that this patient was highly uncritical and childishly gullible. She displayed immaturity, egocentricity, and a poor grasp of material. Her thinking was slow; however, because she had been raised in and was much exposed to a socially stimulating atmosphere, she was very familiar with numerous clichés and many social amenities, thus creating an impression of possessing much social intelligence. Her interpersonal relationships were therefore such as to give the erroneous impression that she possessed at least "normal" intellectual endowment; at any rate this impression was gained when the observation was superficial or casual. On the basis of our test results, which also included a Rorschach analysis, we concluded that this young lady was not a fit subject for analysis or for any type of deep psychotherapy. She managed adequately on a superficial psychotherapeutic plan. Without psychometric investigation, we probably would have fallen into the error of scheduling this young lady for a long series of interviews with deep psychotherapy in mind. However, with her limited psychological assets as revealed by psychometric examinations, the patient as well as the family were spared the necessity of an unrewarding psychotherapeutic procedure. This young patient is now gainfully employed in a vocation that is commensurate with her intellectual limitations, and she derives considerable emotional satisfaction from her work and apparently will continue to remain in good adjustment. On the other hand, should she ever attempt again to compete with people who are her intellectual superiors, she will experience frustration and again become depressed and a so-called problem child.

In the treatment of psychosomatic conditions it is important and useful to know something about the intellectual capacity and endowment of the patient. Unless a patient has an average or a high normal intelligence, it is not possible to deal with him on anything more abstract than the level of reassurance. In other words, it would be a waste of therapeutic time to attempt to explain something of the functions of the sympathetic nervous system, the effect of emotions on bodily function, and to attempt to teach the patient a grasp of abstract concepts if his intelligence were low normal. By means of a Wechsler-Bellevue test one can make an approximation of the level at which the psychotherapy should be pitched. People of dull normal intelligence who are naïve and unsophisticated will respond to reassurance and to suggestive therapy that to a more intelligent person would appear as nothing more than hocus-pocus. By the same token, if a patient has a high normal or superior intelligence, it is possible to treat him with a more penetrating approach and to teach him something of the psychodynamics and pathophysiology of his condition.

RORSCHACH TEST

The Rorschach (ink blot) test is a projective test. It is administered by having the patient look at 10 standard cards on each of which is an ink blot. Each ink blot in itself has minimal conventionalized meanings, so the patient's responses to the blots actually represent functions of his own personality. With this test we obtain a three-dimensional view of the patient's personality (psychogram), which is not possible with the nonprojective tests. Furthermore, with the Rorschach it is possible to detect nuances in personality functioning that cannot be delineated by simpler methods. Many times the Rorschach will reveal personality traits and point to sources of conflict material that otherwise could be found only through long and expensive hours of psychoanalysis. Dunbar says, "It probes beneath the observable behavior, conversation and mannerisms to deep-lying, often unconscious, feelings and motives. The psychosomatic examination usually gives more clearly the specific people and situations in a person's life which occupy his attention; arouses interest, love, anxiety, fear, and the like. The Rorschach Test shows the extent to which his interpretations of his external reality are rational and objective, or distorted and erroneous because of past conditioning. The Test distinguishes between superficial shock reactions and the more deep-seated characteristic reaction patterns. It gives some indication of whether a symptom or illness represents a wholesale solution to most of life's problems or just a temporary expedient in dealing with a specific problem."

In our experience, if the Rorschach test follows the "psychosomatic formula" [6] our therapeutic efforts should be directed primarily toward unraveling the quirks in the patient's psyche as revealed by the analysis. If, on the other hand, the Rorschach does not reveal any significant personality deviations, the physician should interest himself primarily in the somatic aspects of the disease and not spend too many hours searching for psychogenic factors that either do not exist or are of little clinical significance. Cases 5 and 6, used to illustrate how the Rorschach was helpful in this regard, have been reported at greater length elsewhere.[7]

CASE 5.—A 15-year-old boy was suffering from severe bronchial asthma. There was no family history of allergy. The family situation was very stressful, and it was quite evident that the patient had a strong mother fixation. The father was a strict, overbearing, punitive, successful businessman, and the mother invariably assumed a "protective role" as far as the relationship between the patient and his father was concerned. The only relief the boy ever got from his asthma was from epinephrine (Adrenalin), which was given hypodermically always by the mother. In the light of many other variables in the family situation and also because of certain doubts as to the organicity of the boy's asthma, the following questions arose. How much was the asthma an expression of his need to be dominated and cared for by his mother? Were the attacks a weapon that he was unconsciously using against his father, or a device to get attention from his mother, or the expression of some psychosexual conflict? The Rorschach analysis showed quite clearly that the patient was not suffering from the so-called psychosomatic complex, there was no deep anxiety, and there was very little evidence of only a mild neurosis. Dr. Wolff (who referred this case to us) was advised to direct his efforts toward the offending allergens and other medical considerations inherent in the problem. Latest reports indicate that the patient is responding very satisfactorily to medical treatment. On the basis of Rorschach findings and on the basis of the boy's response to medical treatment, psychotherapy in this case would have been a waste of time.

CASE 6.—A 31-year-old attractive white woman was referred for psychiatric survey because she was nervous and was still complaining of abdominal pain in spite of several major operations performed in an effort to relieve the pain. All the physical examinations and laboratory tests carried out by the internist had given normal findings. The patient had endured a number of surgical procedures, but she invariably was worse after each operation. When we saw her, however, there still was some question as to how much of a part the emotional reaction played in the production of her symptoms. The Rorschach analysis showed signs of severe emotional stress, strenuous inner conflict, neurotic behavior, deep anxiety, and emotional immaturity; however, the ego was sufficiently strong to prevent the patient

7. Kamman, G. R.: Psychosomatic Diagnosis, Lancet **67**: 102-107 (March) 1947.

from seeking escape by way of a psychosis. This is what we usually see in the psychosomatic formula. The associational content in the Rorschach revealed the nature and origin of the patient's conflicts, most of which centered around the mother.

On the basis of the Rorschach interpretations it was decided that psychotherapy was indicated. The patient was seen for three hours a week over a period of four weeks, and when she left for her hometown she felt very much better. Several letters from her indicated continued improvement after her return home. This was a case which, on the basis of the psychosomatic history alone and without special psychometric investigation, we would have been unable to tell whether the patient's pain was psychogenic or whether she still had some organic somatic disturbance that was reflecting itself in the psyche as a mental depression. On the basis of the Rorschach diagnosis psychotherapy was instituted and the patient was relieved of all of her physical and mental symptoms.

In case 5 psychotherapy would have been to no avail. In case 6 it brought results that were eminently gratifying to the patient and, incidentally, to the physicians. Had there not been careful investigation of the psychodynamics of these patients by Rorschach analysis, more hours would have been needed to develop a treatment plan.

There are many additional medical conditions in which the Rorschach is helpful in evaluating the importance of psychic factors in a given disease entity. Among these conditions are the sequelae of head injuries. McElroy [8] states, "Almost everyone has had blows on the head but in no two instances are the effects the same." The circumstances surrounding the injury, whether or not the injury was expected as in a sporting event or unexpected as in an automobile accident, compensation features, degree and location of tissue damage, type of first aid and subsequent treatment, and many other factors enter into the production of the so-called post-traumatic syndrome." [9] Frequently it is virtually impossible to separate the neurotic components from the organic components on the basis of a simple medical examination, a neurological examination, examinations of the cerebrospinal fluid, roentgenograms of the skull, and the use of the electroencephalogram. However, the Rorschach test in combination with such tests as the Bender-Gestalt offers fairly conclusive objective information about the degree of neuroticism or the degree of organicity in a given case. For instance, by means of the Rorschach test, which is considered the most valid of the projective techniques in evaluation of organic brain damage, it is possible to isolate certain variables such as repetition, perplexity, confusion, stereotypy, and other well-known combinations of signs that are not seen in neuroses. If one obtains an "organic" Rorschach in a given patient and then obtains a Bender-Gestalt that shows unmistakable evidences of organicity, one has incontrovertible objective proof of the existence of organicity in spite of the fact that the neurological examination is negative, roentgenograms of the skull are normal, the spinal fluid is normal, the air encephalogram and the electrencephalogram are normal, and there are no other demonstrable objective signs of organicity. On the other hand if one obtains a "neurotic" Rorschach pattern and this pattern is supplemented by a neurotic Thematic Apperception Test pattern and also a neurotic Minnesota Multiphasic Profile, there is again incontrovertible objective evidence of the predominance of neurotic factors over any possible organicity.

Another area in which the Rorschach has proved extremely helpful in our hands is in the examination of persons being considered for promotion to administrative or executive levels in large industrial concerns. In addition to undergoing a thorough physical check-up, the prospect is submitted to a battery of psychometric tests, including the ones we have already mentioned. Potential neurotic tendencies, type of reaction to expect in stressful situations, ability to think in the abstract, ability to generalize, creative ability, originality, adaptability, the presence or absence of anxiety factors, how the person approaches situations, and the degree of emotional maturity all can be estimated quantitatively by means of the Rorschach analysis.

Time will not permit a further elucidation of the almost limitless number of instances in which this test can be applied. It must be stated, however, that the test is not absolutely infallible. I know of very few if any laboratory techniques employed in medical investigation that are infallible. However, like a leukocyte count, a urinalysis, or a blood chemistry study, when taken in conjunction with other clinical observations, tests like the Rorschach and others we have mentioned can be of great assistance in medical diagnosis.

THEMATIC APPERCEPTION TEST

The Thematic Apperception Test [5] is a story-telling projective technique. The test material consists of 20 pictures, geared differentially to the age and sex of the patient. The patient constructs a plot for each picture. Each plot is to be complete, dramatic, and the product of the patient's "imagination." From these stories the examiner infers the dominant "thema" in the patient's life, from which the "needs" and "presses" that are basic to the underlying dynamics of the patient's personality are determined. The "thema" reveal the drives, conflicts, relationships, and environmental demands—all of which influence the patient's thoughts and actions. The assumption is that the themes projected into the stories—as seen in the content and in the formal characteristics of the plots—have a relationship to analagous themes in the life of the patient. We use this test as a supplement to the Rorschach test. Again it is extremely useful in psychosomatic diagnosis because it is very effective in pointing out the patient's various attachments, objects of the patient's hostility, his attitude toward himself and toward those with whom he is dealing in everyday living, and something about his ambitions and his drives. These are all very important matters when it comes to assessing the psychic factors in psychosomatic disorders. Case 7 shows the use of this test.

CASE 7.—An attractive 32-year-old mother of three children was referred because of attacks of paroxysmal tachycardia and feelings of panic when in crowds. She had been seen by a number of doctors who gave her the usual bromide and pep talk treatment, she had been told that there was nothing wrong with her, she had been told to "forget it," and she had endured the usual abuse from her family because they failed to understand that she really had physical symptoms. It was not possible by means of vis-à-vis interviews to get much material that would

8. McElroy, J. D.: Head Injuries and Psychiatric Sequelae, J. M. A. Georgia **43**: 127-129 (Feb.) 1954.

9. Kamman, G. R.: Traumatic Neurosis, Compensation Neurosis, or Attitudinal Pathosis? A. M. A. Arch. Neurol. & Psychiat. **65**: 593-603 (May) 1951.

indicate a psychogenic basis for the patient's difficulty. However, the Thematic Apperception Test was very revealing. When the patient looked at a picture that showed an older woman with a little girl (frequently interpreted as a mother-daughter theme) she became very disturbed, she began to cry, and she was unable to complete the test. This gave us a therapeutic clue. Subsequent discussions revealed that the patient's mother had died when the patient was 4 years old, and the patient never had been able to establish a warm relationship with any older women since that time. In other words, she never knew the comforts of an adequate mother substitute. As our psychiatric interviews developed, the patient recalled that on numerous occasions she attempted to establish warm relationships with older women but, for some reason or other they never were satisfying. She referred to a feeling in her chest as being one of "yearning," and as she progressed in her psychotherapy she was able to see that the "yearning" feeling in her chest really was related in some way or another to her attacks of paroxysmal tachycardia. The patient's husband was advised of her emotional needs, it was suggested to him that he pay less attention to golf, hunting, and fishing, and that he spend more time at home and develop a more companionable relationship with his wife. As both the patient and her husband developed insight into her problem, the symptoms gradually abated, and while the patient still is undergoing psychotherapy, she is experiencing marked relief.

SUMMARY AND CONCLUSIONS

Since the major component of at least half of the conditions for which patients consult physicians involve personality factors, such as intelligence, emotivity, and degree of ego integration, and since diagnosis and prognosis of psychosomatic disorders as well as their treatment are influenced to a large degree by these factors, it seems important that the internist be cognizant of the methods of personality evaluation—psychometrics. Just as internists and psychiatrists rely on certain diagnostic procedures carried out in the medical laboratory, they may also rely on certain diagnostic tests and procedures carried out by the clinical psychologist. It is impossible to describe all of the tests in use today; however, we have found five tests particularly useful. These are the Minnesota Multiphasic Personality Inventory, the Wechsler-Bellevue Intelligence Scale, the Bender-Gestalt test, the Rorschach test, and the Murray Thematic Apperception Test.

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Poliomyelitis.—In the course of exploring the extent to which the basic laws of immunology apply to poliomyelitis a number of observations have been made. Perhaps the most important one made in the course of these immunologic investigations, was that the poliomyelitis virus is a relatively potent antigen, and that the quantity of virus as determined by infectivity measurements necessary to produce an antigenic effect was much less than could have been anticipated a priori. Not only has it been observed that levels of antibody induced by the nonliving form of the poliomyelitis virus can be manipulated by attention to details of dosage and interval between inoculation, but that the degree of persistence of measurable antibody can be similarly influenced. But perhaps of equal importance is the fact, known for other antigens and now for poliomyelitis, that once sensitized by a previous injection of vaccine the individual so treated is not the same as he was before vaccination. He now possesses what appears to be a heightened state of hyperreactivity, so that antibody response to vaccine given at a later time will produce a booster effect. The question remains as to whether or not the persistence of measurable levels of antibody in the serum or the presence of the hyperreactive state which we know will provide a rapid boost in antibody level is the necessary prerequisite for effective immunity to the natural disease. . . . it appears that either can be maintained.—J. E. Salk, M.D., Present Status of the Problem of Vaccination Against Poliomyelitis, *American Journal of Public Health*, March, 1955.

CLINICAL NOTES

USE OF THE ARTIFICIAL KIDNEY IN TREATMENT OF THIOCYANATE PSYCHOSIS

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Potassium and sodium thiocyanate have been used in the treatment of hypertension since their introduction to clinical medicine in 1903. At least 14,000 lb. was prescribed for medicinal purposes in the U. S. in 1952.[1] Although their mode of action is not yet fully understood, proper administration of these drugs will produce a significant drop in blood pressure in about 50% of patients.[2] In addition, thiocyanates often succeed in controlling hypertensive headaches that are resistant to other forms of treatment.

The deleterious effects of the improper use of thiocyanates have been frequently stressed.[3] In 1932, Goldring and Chasis reported the first fatalities from the therapeutic use of this drug. Fifty hypertensive patients were given a total of 74 series of treatments with either potassium or sodium thiocyanate under carefully studied conditions. Untoward reactions occurred 13 times in the series (an incidence of 17%), and 2 of the 50 patients died after the development of acute psychotic symptoms. The authors observed that symptoms of toxic effect usually appeared in the following order: muscular fatigue accompanied or followed by nausea, vomiting, disorientation, and mental confusion; motor aphasia; hallucinations of sight and hearing; and, in the fatal cases, progression to delirium, convulsive twitchings, coma, and death. Fifty-three cases of thiocyanate psychosis, with a 32% mortality, have been reported in the literature during the past 23 years.[3c]

It is not fully understood how the thiocyanate ion produces its toxic effects, especially its predilection for deranging the functions of the central nervous system. Tissue assays in cases of fatal thiocyanate poisoning have shown that the susceptibility of the central nervous system is not due to high concentrations of thiocyanate in the brain.[3c] The symptoms of thiocyanate intoxication and those of subacute cyanide poisoning suggest that the effects of thiocyanate were due to liberation of cyanide in the body. Recently, a very sensitive method for the detection of cyanide has made possible the demonstration

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1. Statistical Studies Department, Eli Lilly and Company: Personal communication to the authors.

2. Lindberg, H. A.; Treger, N. V., and Barker, M. H.: The Present Status of Thiocyanate Therapy for Hypertension, Quart. Bull. Northwestern Univ. M. School **22**: 59, 1948.

3. (*a*) Barker, M. H.: Blood Cyanates in the Treatment of Hypertension, J. A. M. A. **106**: 762 (March 7) 1936. (*b*) Goldring, W., and Chasis, H.: Thiocyanate Therapy in Hypertension: Its Effect on Blood Pressure, Arch. Int. Med. **49**: 934 (June) 1932. (*c*) Domzalski, C. A., Jr.; Kolb, L. C., and Hines, E. A., Jr.: Delirious Reactions Secondary to Thiocyanate Therapy of Hypertension, Proc. Staff Meet., Mayo Clin. **28**: 272, 1953.

of the conversion of thiocyanate to cyanide in the body [4]; this is probably brought about by an enzymatic process within the erythrocyte.[5] The production of histotoxic anoxia by cyanide inhibition of cytochrome oxidase and the great sensitivity of the brain to oxygen lack may explain the delirious psychotic reactions that occur with thiocyanate poisoning.[3e]

As yet there is no specific antidote that will convert thiocyanate into a less toxic substance, although methylene blue, sodium thiosulfate, and vitamin B_{12a} have been suggested as antidotes.[3e] The quantity of thiocyanate in the body that is not metabolized is eliminated almost completely by the kidneys.[6] Therefore, the treatment rationale of thiocyanate intoxication has been directed toward withholding the drug and promoting its excretion. The renal clearance of thiocyanate, however, is usually very low irrespective of the rate of urine flow.[7] Thus, in six normal individuals, clearance values ranged from 1.6 to 3.5 cc. per minute, with an average of 2.2 cc. per minute.[8] In addition, the rate of excretion is most unpredictable in any given patient.[6] Many days and even weeks are required to eliminate the drug. One case has been reported in which four months were required for complete elimination of thiocyanate from the blood.[3a]

A patient was admitted recently to Brooke Army Hospital with thiocyanate psychosis. It was decided to supplement the urinary excretion of thiocyanate by extracorporeal hemodialysis. Barbiturate,[9] bromide,[10] and salicyate [11] intoxications have been treated by dialysis, but, to our knowledge, this is the first reported case of thiocyanate intoxication treated in this manner.

REPORT OF A CASE

A 57-year-old white woman, wife of an Army sergeant, had hypertension for approximately four years. An evaluation of her case was made some six months prior to admission to Brooke Army Hospital. At that time her blood pressure was 200/125 mm. Hg, the retinal arterioles were narrow and tortuous, and the heart was slightly enlarged to the left. The blood urea nitrogen was 30 mg. per 100 cc. The urine revealed albumin and a maximum concentration of 1.011. The urea clearance was 39% of normal, and the phenolsulfonphthalein excretion was 26.5% in two hours. Bilateral retrograde pyelography revealed small kidneys with slightly blunted calices, and a diagnosis was made of chronic pyelonephritis with secondary hypertension. Treatment consisted of hexamethonium chloride orally and a low-salt diet. Use of hexamethonium was discontinued after six weeks because of its ineffectiveness in lowering the patient's blood pressure.

Shortly thereafter, the patient was placed on daily oral doses of potassium thiocyanate (dosage scheme and the exact dates of administration are unknown because of the limited data supplied by her local physician), but serum thiocyanate levels were not determined. About six weeks later, it was noted that she was behaving oddly and neglecting her personal appearance. She wrote confused and illegible letters to her husband. These symptoms progressed to extreme confusion, disorientation, forgetfulness, and anorexia. Meanwhile, her blood pressure was lower than it had been in years (150/95 mm. Hg). During a three day stay at a local hospital, she became assaultive, self-destructive, and expressed delusions of persecution. She was given paraldehyde intramuscularly to control her violently disturbed behavior. On March 17, 1953, she was transferred to the closed neuropsychiatric service of Brooke Army Hospital.

Physical Examination.—The patient appeared disturbed, unkempt, and older than her chronological age. She wandered about the ward in a state of aimless confusion. Her sensorium was clouded; she was disoriented in all spheres, forgetful, and capable of only short-lived, simple comprehension. Her speech was impaired by expressive-receptive aphasia, and she had a strong tendency to perseverate. Her behavior sometimes suggested that she was responding to both auditory and visual hallucinations. In addition, she exhibited anomia, alexia, and agraphia.

Blood pressure was 160/104 mm. Hg, pulse rate 84 per minute, respirations 18 per minute, and rectal temperature 100.4 F. The skin was of normal texture and color, with no rash evident. The pupils were round and equal, and they reacted to light and accommodation. The retinal vessels revealed only moderate tortuosity and arteriovenous nicking. The thyroid was not appreciably enlarged. The heart was slightly enlarged to the left, with a regular rhythm and a soft systolic murmur at the apex. The lungs were clear to percussion and auscultation. The abdomen was soft and nontender, with no palpable masses or viscera. Pelvic and rectal examinations were normal. Neurological examination revealed good muscle tone. There was generalized twitching involving small muscle groups, with no evidence of associated sensory impairment. All deep tendon reflexes were hyperactive, and Babinski and Hoffman signs were elicited bilaterally. There was a generalized lack of coordination in her movements. She walked with an unsteady, weaving gait, at times falling against the wall. The Romberg sign was positive. The patient gave a poor performance in the finger-to-nose and heel-to-knee test.

Laboratory Findings.—The red blood cell count was 4,520,000 per cubic millimeter, the hemoglobin level 13.5 gm. per 100 cc., and the white blood cell count 5,400 per cubic millimeter, with 76% polymorphonuclear leukocytes and 24% lymphocytes. The specific gravity of the urine was 1.011, with a negative test for albumin and sugar. Microscopic examination revealed a few white blood cells and two red blood cells per high-power field. The blood urea nitrogen was 32 mg. per 100 cc., and blood serology was negative. Three days after admission, the serum thiocyanate level was found to be 29.9 mg. per 100 cc. Analysis of the serum for bromide and barbiturate was negative. Since it is well known that thiocyanate blocks the uptake of iodine by the thyroid, a radioactive iodine uptake test was performed and found to be only 2% in 17 hours.

Hospital Course.—During the first week of hospitalization in which she received no medication of any kind, there was no appreciable change in the patient's physical or mental condition. She continued to require close supervision because of her clouded mental state. In addition, it was noted that she was becoming increasingly unsteady on her feet. Because the serum thiocyanate level was 26.3 mg. per 100 cc. one week after admission and because no significant clinical improvement had been noted, she was transferred from the closed neuropsychiatric service to the medical service for treatment with the artificial kidney. On the ninth hospital day (March 25, 1953) the patient was dialyzed with the artificial kidney (Kolff-Brigham design)[12] for six hours. As a result, her serum thiocyanate level was lowered from 24.8 mg. per 100 cc. to 1.5 mg. per 100 cc. A total of 3.1 gm. of thiocyanate was recovered in the dialysate (see figure). Other chemical values before and after dialysis are shown in the table. Two days after dialysis, the radioactive iodine uptake by the thyroid gland was 60% in 24 hours.

Despite the marked fall in the serum thiocyanate level, there was no significant, sustained change in the patient's mental con-

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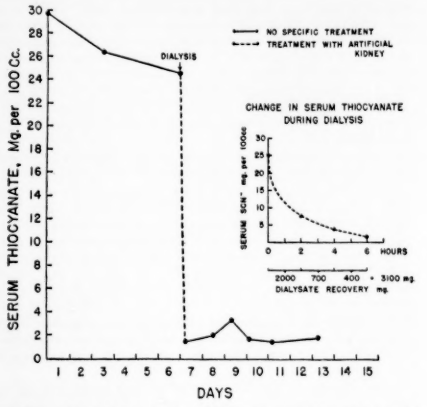
dition during or immediately after dialysis; however, about 22 hours later, she began to improve noticeably. She was much more aware of her surroundings; for the first time, she seemed to enjoy eating and soon developed a ravenous appetite. It was also noted at this time that the muscular twitchings had disappeared. Thirty-six hours after dialysis, the attending physician had difficulty in recognizing her, since her appearance had changed so markedly. This change was due in part to her increased alertness, her brightened expression, her warmer emotional responses, and a clearer comprehension of her environment. Her orientation for time, place, and person was still defective, and she had a large amnesic gap for events in the recent past. She appeared to confabulate in an attempt to fill



Effect of dialysis with artificial kidney on serum thiocyanate level of patient reported on.

in this void in memory. During the next few days, her mental status continued to improve. Six days after dialysis, she was able to express herself coherently, and she had only slight difficulty in the naming of objects. She showed definite improvement in orientation, and she was able to recall recent events. Her behavior and demeanor changed greatly; she became affable, interested in daily happenings, and purposeful in her actions. She showed a healthy, feminine concern with her personal

*Serum Chemistry Values Before and Six Hours After Dialysis**

	Sodium, mEq./Liter	Potassium, mEq./Liter	Carbon Dioxide, mEq./Liter	Chlorides, mEq./Liter	Blood Urea Nitrogen, Mg. per 100 Cc.	Creatinine, Mg. per 100 Cc.	Thiocyanate, Mg. per 100 Cc.
Before	150	4.5	23.4	115	36	2.65	24.8
After	140	4.1	25.8	109	12.5	1.52	1.5

* In patient reported on.

appearance. Her appetite continued to be excellent, and she gained weight. Although her blood pressure averaged 180/100 mm. Hg, she had no symptoms of hypertension. She continued to excrete small quantities of thiocyanate in the urine, and her serum thiocyanate level remained around 1.5 mg. per 100 cc. (see figure) until 15 days after dialysis, when only traces of thiocyanate were detectable in the serum. On April 16, 1953, one month after admission, psychiatric examination revealed that she had recovered from her psychosis. She showed no organic sequelae, and she was discharged from the hospital.

The patient has been seen in the outpatient department on four separate occasions since discharge, the last time being March 25, 1954. There was no evidence of any mental illness, and she had resumed her routine household duties. However, there was evidence of renal impairment, and her blood pressure averaged 160/100 mm. Hg.

COMMENT

Intoxication from the use of thiocyanates in the treatment of hypertension is encountered much more frequently than is generally realized.[13] The therapeutic response to these drugs compares favorably with the results from newer hypotensive agents, although the high incidence of toxic effects has limited the usefulness of thiocyanate. Severe reactions such as psychosis, exfoliative dermatitis, and bloody diarrhea are likely to occur with serum thiocyanate levels above 14 mg. per 100 cc. Toxic reactions may occur at lesser concentrations. One case of toxic psychosis developed with a blood level of only 12 mg. per 100 cc.[14] Fatalities have been reported with blood levels of 3.3 mg. per 100 cc., 4.2 mg. per 100 cc., and 7.0 mg. per 100 cc.[13] Most of the deaths reported from this drug have occurred at least 10 days after the last dose.[7] It is sometimes difficult to determine the potential seriousness of intoxication by simply relying upon the serum thiocyanate level, although it is recognized that, in general, levels above 14 mg. per 100 cc. are more dangerous than levels below this value.

Thiocyanate psychosis is often misdiagnosed as hypertensive cerebrovascular disease. Barnett and coworkers recognized thiocyanate intoxication in at least four of eight patients who were thought by their physicians to be suffering from hypertensive cerebrovascular disease.[15] The case reported was also unrecognized, and potassium thiocyanate was actually prescribed during the psychotic phase of the patient's illness.

Increasing severity of the psychosis after discontinuing therapy with the drug does not invalidate the diagnosis of thiocyanate intoxication. Focal neurological signs should not conceal the diagnosis. Any patient with delirium of obscure origin may be suffering from thiocyanate intoxication, and this is particularly relevant in a patient found to be hypertensive. Serum analysis should be made despite denial of drug intake by relatives or ignorance of its prior prescription by the attending physician. Neglect of such an analysis often results in failure to recognize thiocyanate poisoning.[15]

Once a diagnosis of thiocyanate intoxication has been established, it is imperative that prompt, active, and efficient measures be made to eliminate the drug. Renal excretion of thiocyanate, unfortunately, is a relatively slow and unpredictable process, especially in patients with some degree of renal impairment. There is some reason to believe that the renal clearance of thiocyanate is more dependent upon chloride excretion than upon water diuresis.[7] It has been suggested that chlorides be administered in the treatment of thiocyanate intoxication. Even by this means, however, the elimination of thiocyanate is still too slow to prevent serious and sometimes fatal consequences.

In the case reported, dialyzing the patient with the artificial kidney seemed a logical procedure. The patient was critically ill, and she was unable to excrete thio-

13. Gorman, W. F.; Messinger, E., and Herman, M.: Toxicity of Thiocyanates Used in the Treatment of Hypertension, Ann. Int. Med. **30**: 1054, 1949.

14. Carratalá, R.: Intoxicación por tiocianato de potasio, Rev. Asoc. méd. argent. **58**: 861, 1944.

15. Barnett, H. J. M.; Jackson, M. V., and Spaulding, W. B.: Thiocyanate Psychosis, J. A. M. A. **147**: 1554 (Dec. 15) 1951.

cyanate rapidly enough to lessen the severity of her psychosis. This intoxication might have proved fatal unless effective means were found to lower the high concentration of thiocyanate in her body. Thiocyanate is a small molecule and diffuses readily through the cellophane membrane that is used on the artificial kidney. Dialysis should be effective, since this ion is only partially bound to protein in the serum,[16] since the thiocyanate in the serum is in equilibrium with the extracellular fluid of the body,[17] and since the majority of administered thiocyanate remains in the extracellular fluid, which is a smaller reservoir than total body fluid.[17] In addition, the artificial kidney has no tubules for selective resorption of the filtered thiocyanate. These physical and chemical properties of thiocyanate indicate that the artificial kidney should be a very efficient means of rapidly eliminating large quantities of the drug from the body.

These considerations were confirmed during a six hour dialysis in the reported case. The patient's thiocyanate level was reduced from 24.8 mg. per 100 cc. to 1.5 mg. per 100 cc., and 3.1 gm. of thiocyanate (SCN^-) was recovered in the dialysate. The patient's mental condition began to improve noticeably about 22 hours after dialysis, and she made a complete and uneventful recovery from her psychosis. Since this patient was treated, further investigative studies reveal that the Kolff-Brigham artificial kidney is 73.6 times more efficient than normal kidneys in removing thiocyanate.[8] It is suggested that extracorporeal hemodialysis be considered in the treatment of thiocyanate intoxication.

SUMMARY AND CONCLUSIONS

Thiocyanate psychosis is attended by a high mortality, and active measures should be taken to eliminate the drug from the body as promptly as possible. In the case presented here, a patient with psychosis, resulting from thiocyanate intoxication, was treated by dialysis with the artificial kidney. By this means, the serum thiocyanate level was markedly reduced, from 24.8 to 1.5 mg. per 100 cc. during a 6 hour dialysis, and, about 22 hours later, the patient's mental condition improved noticeably. She went on to a complete and uneventful recovery from her psychosis. Further studies have also substantiated the effectiveness of the artificial kidney in removing thiocyanate in vivo. This method should be considered the preferred treatment in all cases of thiocyanate intoxication.

125 E. Jones St., Savannah, Ga. (Dr. Danzig).

16. Scatchard, G.; Scheinberg, I. H., and Armstrong, S. H., Jr.: Physical Chemistry of Protein Solutions: V. The Combination of Human Serum Albumin with the Thiocyanate Ion, J. Am. Chem. Soc. **72**: 540, 1950.

17. Crandall, L. A., Jr., and Anderson, M. X.: Estimation of the State of Hydration of the Body by the Amount of Water Available for the Solution of Sodium Thiocyanate, Am. J. Digest. Dis. **1**: 126, 1934.

Patents and Copyrights.—An ethical physician will not receive remuneration from patents on or the sale of surgical instruments, appliances and medicines, nor profit from a copyright on methods or procedures. The receipt of remuneration from patents or copyrights tempts the owners thereof to retard or inhibit research or to restrict the benefits derivable therefrom to patients, the public or the medical profession.—Principles of Medical Ethics of the American Medical Association, chapter 1, section 7, June, 1954.

RADIOACTIVE PHOSPHORUS IN THE DIAGNOSIS OF SKIN TUMORS

DIFFERENTIATION OF NEVI, MALIGNANT MELANOMAS, AND OTHER SKIN TUMORS

Franz K. Bauer, M.D.
and
Charles G. Steffen, M.D., Los Angeles

Cells with increased metabolic activity require more phosphorus than similar cells with normal metabolism. This fact has been utilized to localize malignant lesions, both primary and metastatic, by external counting of concentrations of radioactive phosphorus (P^{32}) as a tracer.[1] This study was undertaken in an attempt to develop a simple clinical procedure whereby benign nevi could be differentiated from malignant melanomas even before biopsy, since the extent of the biopsy could be influenced by such knowledge. Evidence of increased radiophosphorus concentrations may also be of help in equivocal histopathological interpretations, which are so common in so-called juvenile melanomas and junction nevi. This preliminary report gives data on 70 patients with a wide variety of benign and malignant skin tumors, with emphasis on intradermal nevi and malignant melanomas.

METHOD

Radioactive phosphorus (P^{32} sterile solution) is injected intravenously in doses of from 100 to 150 μc. This dose is far below the "minimal hematological dose" (the smallest amount of P^{32} that produces discernible hematological reactions).[1e] One to three hours later, the lesion is counted with an end window Geiger-Mueller tube, which is encased in a housing of Lucite. Different size Lucite attachments with ports from ¼ in. to 1 in. can be fitted over the window. The Lucite casing was designed to eliminate radiation from surrounding skin. Five hundred counts are taken over the lesion and the same number over the contralateral normal area, by the same port. The results are expressed as a ratio of counts of abnormal to normal areas. The tube used has an intrinsic background of 0.8 counts per second at 1,400 volts. The number of counts obtained over normal skin is of the order of 3 to 10 counts per second, depending on the aperture of the port, with a greater number of counts obtained with larger ports.

RESULTS

Of the 70 patients studied, there were 6 with proved malignant melanoma, 10 with squamous cell carcinomas, and 9 with basal cell carcinomas. The remainder of the

From the Radioisotope Unit, Wadsworth General Hospital, Veterans Administration Center, Los Angeles, and the Department of Medicine, University of California at Los Angeles.

1. (*a*) Kenney, J. M.; Marinelli, L. D., and Woodard, H. Q.: Tracer Studies with Radioactive Phosphorus in Malignant Neoplastic Disease, Radiology **37**: 683-687 (Dec.) 1941. (*b*) McCorkle, H. J.; Low-Beer, B. V. A.; Bell, H. G., and Stone, R. S.: Clinical and Laboratory Studies on the Uptake of Radioactive Phosphorus by Lesions of the Breast, Surgery **24**: 409-415 (Aug.) 1948. (*c*) Marcus, R., and Rotblat, J.: Diagnostic and Therapeutic Uses of Radioactive Isotopes: Symposium: Application of Radioactive Isotopes in Case of Multiple Melanomata, Brit. J. Radiol. **23**: 541-549 (Sept.) 1950. (*d*) Krohmer, J. S.; Thomas, C. I.; Storaasli, J. P., and Friedell, H. L.: Detection of Intraocular Tumors with the Use of Radioactive Phosphorus, Radiology **61**: 916-921 (Dec.) 1953. (*e*) Low-Beer, B. V. A.: The Clinical Use of Radioactive Isotopes, American Lectures in Radiation Therapy, No. 54, Springfield, Ill., Charles C Thomas, Publisher, 1950. (*f*) Marinelli, L. D., and Goldschmidt, B.: The Concentration of P^{32} in Some Superficial Tissues of Living Patients, Radiology **39**: 454-463 (Oct.) 1942.

patients had intradermal or junction nevi, seborrheic keratoses, verrucae, and granulation tissue following burns or biopsies (tables 1 and 2).

No significant differences could be detected in a single instance of nevi and seborrheic keratoses and verrucae. Ratios were of the order of 1.0. Basal cell carcinomas showed ratios of from 0.88 to 1.75, with the exception of one lesion, which was fungating and had a ratio of 2.9. Squamous cell carcinomas had concentrations of radiophosphorus with ratios of from 1.05 to 1.75, with the exception of two fungating lesions (ratios 3.14 and 4.14). The four patients with malignant melanomas of the skin had increased concentrations, with ratios of from 2.5 to 3.85. Whenever more than a few millimeters of tissue was interposed between the lesion and the tube, the ratio between tumor and the normal area decreased. Such was true of the patient in case 48, whose malignant melanoma was under a fingernail and the patient in case 46, who had a lesion metastatic to a rib. It is thus apparent that only in superficial lesions can significant differences in counts be obtained. No patient with a benign tumor was found to have increased concentration of P^{32}, and no patient with increased concentration was found to have a benign lesion. In one patient in whom a malignant melanoma of the axilla was suspected clinically, the ratio was 2.0 and histological examination revealed hidradenitis suppurativa. Granulation tissue, such as occurs after burns or biopsies, gave higher counts than corresponding normal skin, presumably due to extravasation of P^{32} containing serum and the increased P^{32} content of granulating tissue.

TABLE 1.—*Uptake of Radioactive Phosphorus by Basal Cell and Squamous Cell Carcinomas*

Histological Diagnosis	Case No.	Ratio of Tumor to Normal Counts per Second
Basal cell carcinoma	6	1.56
	11	1.2
	13	1.45
	17	1.22
	18	1.24
	28	1.7
	38	2.9*
Pigmented adnexal basal cell carcinoma	12	0.88
Squamous cell carcinoma	5	4.14*
	8	1.75
	14	3.14*
	15	1.07
	22	1.14
	23	0.98
	27	1.18
	29	1.82
	30	1.05
	41	1.73

* Fungating lesion.

COMMENT

Increased concentration of radiophosphorus in malignant tumors has been demonstrated repeatedly in biopsy specimens and by external counting. Up to 7 times more P^{32} was found in malignant melanomas than in normal tissue by Marinelli and Goldschmidt [1f] and 4 to 10 times more by Marcus and Rotblat.[1e] All of these studies were undertaken with the thought of administering radiophosphorus as a therapeutic agent; however, the concentrations in tumor tissue were so low that all of the investigators regretfully abandoned any attempts to attack these tumors by this method.

In the diagnosis of tumors close to the body surface, such as eye tumors [1d] and breast tumors,[1b] radioactive phosphorus (P^{32}) and radioactive potassium (K^{42})[2] are used as tracer agents at this time. Both phosphorus and potassium are universal cell constituents and, therefore, logical tracer agents for the determination of increased metabolic activity. P^{32} is a more convenient material, since its physical half-life is 14.3 days and it is a beta emitter. K^{42}, on the other hand, has a physical half-life of only 12.4 hours and emits gamma rays, which make it less easy to handle and more expensive, since it must be shipped by air and heavily shielded. The disadvantage of P^{32}, however, is the fact that its most energetic beta particles penetrate only about 7 mm. in tissue. This makes external counting of lesions beneath the skin impractical. Since oozing and granulating lesions give high concentrations of P^{32}, external counting as described in this paper should be done before biopsy.

It should be pointed out that increased concentration of P^{32} in tissue does not necessarily mean malignant degeneration. Increased metabolic activity is, of course, also present in infections and granulating wounds. The increase in phosphorus, therefore, is merely an indication of increased growth and, if present, should make the clinician "malignancy conscious." The degree of phosphorus cencentration is also proportional to the rate of growth, which explains the low ratios in basal cell and squamous cell carcinomas in our series of patients, as contrasted with the malignant melanomas. Our findings agree with those of others that the concentrations of P^{32} in malignant skin tumors would be far too low for systemic therapy. We feel, however, that, with the simple technique described in this paper, very valuable information can be gained in the differentiation of nevi from malignant melanomas.

TABLE 2.—*Uptake of Radioactive Phosphorus by Benign Nevi and Malignant Melanomas*

Case No.	Histological Diagnosis	Ratio of Tumor to Normal Counts per Second
1	Junction nevus, pigmented	1.22
4	Intradermal nevus, pigmented	1.03
45	Intradermal nevus, pigmented	1.06
6	Malignant melanoma, cutaneous, pigmented	2.50
10	Malignant melanoma, cutaneous, pigmented	3.44
39	Malignant melanoma, cutaneous, nonpigmented	3.85
48	Malignant melanoma, pigmented, nailbed (nail intact)	1.3
34	Metastatic malignant melanoma, inguinal lymph node	3.7
46	Metastatic malignant melanoma, nonpigmented, of rib	1.3

SUMMARY AND CONCLUSIONS

When radioactive phosphorus (P^{32}), in doses of from 100 to 150 μc, was injected intravenously into patients with a variety of skin tumors and the lesions counted with a Geiger-Mueller tube three hours later, it was found that in superficial lesions significant differences in counts could be obtained. Malignant melanomas can be differentiated from benign nevi by significantly increased concentrations of P^{32}. Basal cell carcinomas and squamous

2. Baker, W. H.; Nathanson, I. T., and Selverstone, B.: Use of Radioactive Potassium (K^{42}) in the Study of Benign and Malignant Breast Tumors, New England J. Med. **252**: 612-615 (April 14) 1955.

cell carcinomas cannot be differentiated from benign skin lesions with any degree of accuracy by the procedure described.

ADDENDUM

Since the submission of this paper for publication, eight additional cases of cutaneous malignant melanoma were correctly diagnosed by the method described. There have been no false-positive or false-negative results.

FATAL POISONING WITH DIBUCAINE HYDROCHLORIDE (NUPORAL) LOZENGES

REPORT OF A CASE WITH AUTOPSY

William U. McClenahan, M.D., Philadelphia

This is a report of a fatal case, with autopsy findings, in which death occurred after accidental ingestion of eight Nuporal troches by a 3-year-old child. The manufacturers state that they know of no similar instance, and a search of the literature fails to reveal any similar case. Nuporals are anesthetic lozenges used for the symtomatic relief of pain in the mouth or throat. Each troche contains 1.0 mg. of dibucaine hydrochloride and 0.91 gm. of glucose. These troches are sold only under a physician's prescription, and the label warns that they are not advisable for children under the age of 5 years.

Dibucaine (Nupercaine) hydrochloride, a quinoline derivative, is a potent anesthetic agent and a toxic one. When injected subcutaneously it is 12 times as toxic as cocaine, and the recommended concentration of this drug for surface anesthesia of the throat is one-tenth to one-twentieth that of cocaine.[1] The reaction of experimental animals to oral administration of the drug varies considerably, a dose of 10 mg. per kilogram leading to death in some dogs but only to nausea and vomiting in others.[2] The oral lethal dose for human beings has not yet been established. Like procaine, the drug is rapidly destroyed by the liver, but the duration of anesthesia of dibucaine hydrochloride is far greater than that of procaine or cocaine.

REPORT OF A CASE

The patient weighed 35 lb. (10.6 kg.). Her history was normal except for mild atopic dermatitis. There had been no other evidence of allergy. She had on several occasions stolen one or two Nuporal lozenges, used by her mother for sore throats, so they had been hidden in a place apparently completely inaccessible to her. On the day of her death she was left alone very briefly at 3 p. m., and on her mother's return she was found eating from a new box of Nuporal lozenges, which she had nearly consumed. The two in her mouth were removed, but eight could not be accounted for and had evidently been swallowed, a dose equivalent to 0.8 mg. per kilogram of body weight. She was promptly taken to a hospital, where gastric lavage was instituted about 20 minutes after she took the tablets. At that time she seemed entirely normal. Although she resisted strenuously at first, she began to be lethargic by the time the procedure was completed and slept afterward. Less than two hours after taking the tablets she was comatose, with a soft edema of the face and neck, cyanosis, and slow irregular shallow breathing at the rate of 4 to 5 per minute. The pulse rate was slow, about 55 per minute, and the blood pressure, obtained with difficulty, was 60/40 mm. Hg. A dose of 0.4 cc. of 25% nikethamide solution was given intravenously, with considerable improvement that was, however, only temporary. This was repeated half an hour later, and a dose of 0.18 gm. of caffeine and sodium benzoate was also given intramuscularly. Improvement in pulse and respiration was again noted. The swelling of the face and neck, however, increased, and generalized, soft nonpitting edema of the entire body was noted.

At 6 p. m. treatment with 50 cc. of 25% dextrose was given intravenously, and the child was put into a McKesson negative pressure–positive pressure respirator, while oxygen was maintained through a face mask and the pharynx repeatedly aspirated. It was hoped that anoxia could be relieved through the period necessary for the liver to detoxify the dibucaine hydrochloride. The child remained flaccid during the following five hours and showed no respiratory efforts whatever. The pulse remained regular, rapid, and moderately strong until 11 p. m., when it failed abruptly and the patient was pronounced dead. No spasms or convulsions were observed at any time during the illness.

An autopsy was performed two hours after death. Low grade aspiration pneumonitis and acute mesenteric lymphadenitis associated with a subacute catarrhal duodenitis and jejunitis were found present. Actually no apparent cause of death was determined by the examination.

COMMENT

The dose of the drug ingested would not ordinarily have been enough to have caused symptoms of importance in a child of this size. It appears that either sensitization or idiosyncrasy was present. The generalized, soft, nonpitting edema was apparently of an allergic nature. The father of the child, an internist, has since seen a similar case in consultation, apparently a delayed reaction to tetracaine (Pontocaine) hydrochloride, used for spinal anesthesia, in which there was coma and a generalized, soft, nonpitting edema of the same appearance. The patient recovered, with the help of parenteral cortisone, after several days of critical illness.

It seems important that this report should go on record, both as a contribution to the symptomatology of allergy to cocaine substitutes and as a warning of the possible danger in as seemingly innocuous a medicament as throat lozenges.

SUMMARY

A 3-year-old child suffered severe respiratory and circulatory failure and had generalized soft edema beginning in the head and neck and died eight hours after the accidental ingestion of eight dibucaine hydrochloride (Nuporal) tablets, despite every effort to remove the drug from the stomach, stimulate respiration, and maintain adequate oxygenation through a period that might have seemed sufficient for the liver to detoxify the substance.

1 Summit St. (18).

The Ciba Pharmaceutical Products, Inc., Summit, N. J., submitted information on the toxic properties of dibucaine (Nupercaine) hydrochloride.

1. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics, ed. 2, New York, the Macmillan Company, 1955.

2. Yonkman, F. F., and Graeme, J. L., Ciba Pharmaceutical Products, Inc.: Personal communication to the author.

Cough and Sneeze Sprays.—During cough, particles are propelled through the air at the rate of 150 to 160 feet per second. In normal-toned conversation these same particles are sprayed for a distance of 8 feet. A cough sprays about 12 to 15 feet and a sneeze sprays as much as 20 feet.—A. Worth Hobby, M.D., Cough, Its Pathology and Management, *The American Journal of Surgery*, February, 1955.

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MANAGEMENT OF THE MENOPAUSE

The menopause is a period in the life of a woman that is characterized by gradual cessation of ovarian function plus emotional factors associated with advancing years. The exact proportion of such women who require treatment is difficult to ascertain but has been variously estimated. Taylor [1] believes that about 25% have unpleasant symptoms but that only half of these seek medical aid. Chapman [2] states that about 80% have unpleasant symptoms but that these symptoms are severe in only about 10%. Novak [3] believes that 10 to 15% require treatment. He further states that the only clear-cut symptoms of ovarian failure, and hence the only indications for replacement therapy, are hot flushes involving the head, neck, and upper thorax, with or without sweating in these areas, and the less troublesome hot flashes or hot tingling sensations involving the entire body. These may be aggravated by emotional stress. Other symptoms associated with menopause, such as headache, vertigo fatigue, arthralgia, nervousness, and irritability, are probably functional and not due to estrogen deprivation. In those patients in whom the symptoms are severe enough to warrant some sort of treatment, it is necessary first to make sure that the symptoms are due to the menopause. In any case the patient should be assured that she does not have a disease, that the menopause is not attended by dire consequences, and that it will not persist indefinitely. In many patients this is all that is required, but, if the patient is inclined to be high strung, mild sedation may be prescribed. Vitamin E has been advocated by some for the control of menopausal symptoms, but Blatt and his co-workers [4] in a carefully controlled study found that it gave no better results than those obtained from giving a placebo.

If a hormonal agent must be given, it should be a long-acting drug that when given by mouth will inhibit pituitary activity without producing unpleasant side-effects. Estrogenic pellets are long acting and may be useful in some patients, but administration of estrogens other than by mouth is rarely indicated. Diethylstilbestrol is the estrogen most widely used, but chlorotrianisene is gaining in popularity. It may be given by mouth, and, because it accumulates in the adipose tissues, whence it is liberated gradually, it is long acting.

According to a statement by Blatt and his co-workers, objection has been made to administration of estrogens on the ground that all the patient needs is psychotherapy and sedation. It is true that estrogen therapy should not be given for alleged menopausal symptoms to any patient who still has menstrual periods and that the unwise use of estrogens may do more harm than good. It is further objected that estrogens may be carcinogenic. Although this may be true for mice, it has never been proved for human beings, and some physicians [1] give estrogens without hesitation even to women who have had cancer. Most authorities, however, prefer to take no chances and do not give estrogens to such patients.

Another objection to use of estrogen therapy is that it may cause uterine bleeding. This creates a dilemma for the physician, because, although he may believe that the bleeding is probably caused by the medication, he cannot be sure without curettage. Uterine bleeding can usually be avoided by giving the estrogen in the smallest effective doses and decreasing the frequency of the doses as rapidly as is consistent with controlling the symptoms. This is especially important because prolonged continuous treatment with such agents will postpone the inevitable adjustment the body must make and prolong the period of unpleasant symptoms. Taylor [1] states that it is rarely necessary to continue estrogen therapy longer than one year.

Patients who have endometriosis or uterine fibromyomas should not be given estrogens, but in such patients androgens may give relief. Although Chapman [2] states that the results from giving either an estrogen or an androgen alone are better than those obtained by giving these hormones together, Novak [3] finds the popularity of the combined use of these hormones increasing. They act synergistically because they both suppress the gonadotrophic function of the pituitary. Such treatment appears to decrease the likelihood of uterine bleeding and to permit the use of reduced doses. Unsatisfactory results from combined treatment, with use of both estrogens and androgens, are sometimes observed in patients who have previously been given estrogens alone in large doses without relief.

It would appear that there is now available an effective treatment for every woman with true menopausal symptoms and that, with skilled adjustment of the dosage of whatever therapeutic agent is used, the sufferers who are most in need of treatment may be helped over this trying period.

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V 1
195

TO OUR NEW PROFESSIONAL BRETHREN

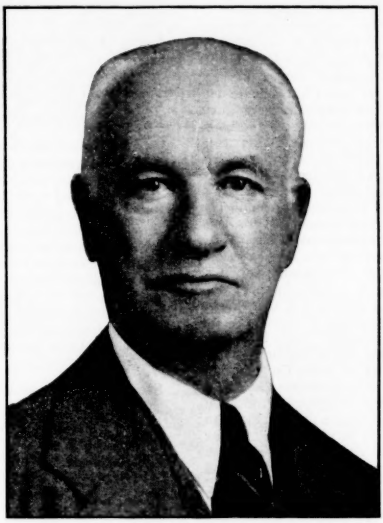
During the commencement exercises occurring on the campuses of institutions of higher education throughout the nation this year, nearly 7,000 senior medical stduents will be awarded the degree of doctor of medicine. Soon thereafter they will initiate their graduate education as interns. We in the profession of medicine extend heartfelt congratulations to you in this new group of physicians, representing the largest number ever to complete their undergraduate medical education in a single year. Now that the arduous undergraduate years of study that constitute the first major phase of the continuing educational challenge are over, we extend best wishes for your continued success and happiness in the long and exacting road that lies ahead as you constantly further prepare yourselves to be of the greatest possible service to your fellowmen.

Throughout the past four years of study, awareness has been created in you of the rapidity with which advances in scientific knowledge are taking place and of their implications in the dynamic field of modern medicine. Graduation from medical school in a time when such advances are being made is truly a commencement and only the beginning of life-long study. As you look ahead, it is well to remind yourselves of the terse comment of John Chalmers DeCosta to the effect that "Each one of us, however old, is still an undergraduate in the school of experience. When a man thinks he has graduated, he becomes a public menace."

The traditions of medicine are rich, and there is reason to take pride in the heritage that its professional forefathers have passed on to those who wear the mantle of the physician. The young physician of today must recognize that times and circumstances are changing with a speed hitherto unknown and that new concepts and traditions are being developed. Many interesting and difficult problems lie ahead, and you will face these challenges with courage and fortitude. As you play your important role as physicians and citizens, it is well to remember the comment of an anonymous author who wrote that "To be radical in politics, in medicine, in sociology, in religion, in anything without being a fool is a matter of no small difficulty." Stick to your ideals, and guide your life by the philosophy of the first-rate in all of your actions as a physician and as a citizen. Welcome to our profession, good luck, and Godspeed.

DR. DONALD C. BALFOUR AWARDED DISTINGUISHED SERVICE MEDAL

Each year since 1938 at its Annual Meeting the House of Delegates of the American Medical Association has chosen an outstanding physician to receive its Distinguished Service medal. The Board of Trustees submits three names to the House, and the final selection is made from these. This year in Atlantic City Dr. Donald C. Balfour of Rochester, Minn., was chosen for his contribution to the field of general surgery. Because Dr. Balfour was unable to be present at the meeting to receive the award in person, the gold Distinguished Service medal was accepted for him by his son, Dr. William Balfour, also of Rochester.



DONALD C. BALFOUR, M.D.
AWARDED DISTINGUISHED SERVICE MEDAL

Dr. Balfour was born on August 22, 1882, in Toronto, Canada, and received the M.B. degree from the University of Toronto in 1906 and his M.D. from the same university in 1914. He began the practice of medicine at the Mayo Clinic in 1907 and became head of the division of surgery as well as professor of surgery at the University of Minnesota. Since 1935 he has been associate director, director, and emeritus director of the Mayo Foundation for Medical Education and Research. He received honorary LL.D. degrees from the University of Toronto, Carleton College, and St. Olaf College and the honorary degree D.Sc. from McMaster University and Northwestern University. In 1935, with Dr. G. B. Eusterman as co-author, he published a book entitled "The Stomach and Duodenum." He has also written many monographs and articles on general surgery.

In 1941 he was made honorary consultant to the medical department of the U. S. Navy and in 1943 an honorary consultant to the Army Medical Library. In 1948 President Truman presented him with a Certificate of Merit for outstanding service in the war effort. He has been a member of the Advisory Board for Medical Specialities of the American Medical Association; the committee on surgery of the National Research Council; the American Association for the Advancement of Science; the Interstate Postgraduate Medical Assembly of North America, of which he was president in 1945; and numerous other medical societies, including societies in France, Britain, Italy, and Hungary. This latest honor bestowed on Dr. Balfour is but another evidence of his valuable service in the practice of medicine throughout the world.

ORGANIZATION SECTION

FEDERAL MEDICAL LEGISLATION

First Session, 84th Congress

Salk Vaccine

A series of bills referring to the Salk vaccine have been introduced in the House and Senate. Senator Morse (D., Ore.), in S. 1691, proposes to establish an emergency commission to insure the most effective and equitable distribution of the Salk vaccine to prevent infantile paralysis. The five man commission would be headed by the surgeon general of the Public Health Service and would include a representative of the state public health officials, a representative of the manufacturers, a representative of the National Foundation of Infantile Paralysis, and Dr. Salk himself. The commission could, if it deems advisable, recommend price-fixing legislation. Appointed by the Secretary of Health, Education, and Welfare, the commission would expire when, in the opinion of the commission, sufficient Salk vaccine was available to make further control unnecessary.

Senator Langer (R., N. D.), in S. 1781, would authorize the Secretary of the Department of Health, Education, and Welfare "to acquire by purchase such supplies of Salk infantile paralysis vaccine as the Secretary may deem necessary and as may be available, and to use such vaccine to make available to all citizens of the United States, without cost to them, immunization against infantile paralysis." The Secretary would be authorized: "(1) to utilize, on a reimbursable basis or otherwise, the services, facilities, and personnel of all departments and agencies of the Federal Government; (2) to enter into agreements for the utilization, on a reimbursable basis or otherwise, of the services, facilities, and personnel of State and local health departments and other State and local agencies; and (3) to contract for, and accept donations of, the services of private physicians." The Secretary would "promulgate such regulations as may be necessary to insure that in carrying out this Act, infantile paralysis vaccine will first be made available to persons in those age groups most susceptible to infantile paralysis, and that it will be made available to persons in all geographical areas on a fair . . . basis and without unjust discrimination." These bills were referred to the Committee on Labor and Public Welfare.

Congressman Rains (D., Ala.), in H. R. 5599, Congressman Celler (D., N. Y.), in H. R. 5611, and Congressman Addonizio (D., N. J.), in H. R. 5696, would amend the Defense Production Act to give the President authority to require manufacturers to fulfill selected orders for Salk vaccine in preference to other orders for such vaccine and "to allocate Salk vaccine in such manner, upon such conditions, and to such extent as he shall deem necessary or appropriate to promote the public welfare." All the authority conferred in the act would terminate June 30, 1957. These bills were referred to the Committee on Banking and Currency. Congressman O'Neill (D., Mass.) in H. R. 5662, would authorize and direct the Secretary of Health, Education, and Welfare "to purchase a supply of the Salk vaccine for the prevention of paralytic poliomyelitis, and to distribute such vaccine to the public health agencies of the several States in amounts sufficient to ensure that all persons who desire to receive such vaccine may be given it without charge for the cost of such vaccine." This bill was referred to the Committee on Interstate and Foreign Commerce.

Commission on Nursing Services

Senator Smith (R., N. J.), in S. J. Res. 56, would establish a 12 member commission on nursing services to aid the "nursing profession in its efforts to achieve greater efficiency and improved nursing services." The commission would be appointed by the President of the United States, the President of the Senate, and the Speaker of the House, who would each appoint four members, one-half in government and Congress and one-half in private life. The nursing and medical professions would be represented on the commission, which would gather data for all types of nursing services—professional and practical nursing and nursing aides—and would make interim reports to Congress and a final report within two years, after which the commission would expire. This measure, identical with H. J. Res. 171, was referred to the Committee on Labor and Public Welfare.

Grants to States for Hospital or Domiciliary Buildings of State Soldiers' Homes

Senators Monroney and Kerr (D., Okla.), in S. 1459, and Democratic Congressmen from Oklahoma, Albert, in H. R. 4977; Edmondson, in H. R. 4986; Jarman, in H. R. 4988; Steed, in H. R. 5006; and Wickersham in H. R. 5009, have introduced identical bills "to provide assistance to the States in the construction, modernization, additions, and/or improvement of domiciliary or hospital buildings of State or Territorial operated soldiers' homes by a grant to subsidize in part the capital outlay cost." They would authorize "to be appropriated the sum of $5,000,000 annually, for five consecutive years, to remain available annually until expended." Grants would be on a 50-50 matching basis for construction, modernization, additions, or improvements. The program would be administered by the Veterans' Administration. The Senate bill was referred to the Committee on Labor and Public Welfare, the House bills to the Committee on Veterans' Affairs. Congressman Miller (D., Calif.) has introduced, in H. R. 446, a similar measure, except that the federal government would reimburse the states "an amount equal to 50 per centum of its expenditures of new construction and 33⅓ per centum of its expenditures of remodeled, modernized, or improved buildings." This bill was referred to the Committee on Veterans' Affairs.

Tax Exemption for Hospital Bequests and Gifts

Congressman Mailliard (R., Calif.) and Congressman Shelley (D., Calif.), have introduced identical measures, H. R. 4813 and H. R. 4822, that would make bequests and donations to a nonprofit hospital exempt for state and gift tax purposes as is now true for municipally owned hospitals. A hospital would be eligible only if the following conditions were met: (1) such hospital is open to the general public; (2) that all funds and revenues of the hospital be devoted exclusively to maintenance and operation of debt servicing; (3) that no individual private stockholder receive any benefit; and (4) that no substantial part of the activities of the hospital involved attempts to influence legislation. These measures were referred to the Committee on Ways and Means.

Social Security Coverage for Self-Employed

Physicians.—Congressman Anfuso (D., N. Y.), in H. R. 5031, proposes to amend the Social Security Act to include the compulsory coverage of physicians except for chiropractors, naturopaths, and Christian Science practitioners. He would also increase the minimum benefits from $30 to $40 per month and would increase the permissible outside earnings from $1,200 to $1,500 a year and reduce the retirement age from 65 to 60 years.

Dentists.—Congressman Mack (D., Ill.), in H. R. 5431, would include the self-employed dentists in social security coverage. These bills were referred to the Committee on Ways and Means.

Lawyers.—Senator Magnuson (D., Wash.), in S. 1830, would include compulsory Old-Age and Survivors Insurance benefits for individuals engaged in the private practice of law. This bill is identical with H. R. 4574 by Congressman King (D., Calif.) previously reported; it was referred to the Committee on Finance.

Insurance Benefits for the Disabled

Congressman Zabolocki (D., Wis.), in H. R. 5057, would "amend the Social Security Act to provide disability insurance benefits for totally disabled individuals, and to provide benefits for the wives and minor children of such individuals." The disability insurance benefits would be given to the disabled persons prior to the age of retirement and would be equal to the person's primary Old-Age and Survivors Insurance benefits. In making disability determinations, the Secretary of the Department of Health, Education, and Welfare could secure the cooperation of "Private medical, dental, hospital, nursing, health, educational, social, and welfare groups or organizations" and pay for such examinations. This bill was referred to the Committee on Ways and Means.

V 1
195

MEDICAL NEWS

ALABAMA

Professors of Medicine Appointed.—Dr. Robert C. Berson, dean of the Medical College of Alabama, Birmingham, has been appointed professor of medicine on a voluntary basis and installed as vice-president for health affairs at the medical center, May 15. Dr. Thomas F. Paine Jr., professor of microbiology, was also appointed professor of medicine on a voluntary basis.

Personal.—Dr. Louis L. Friedman, Birmingham, has been appointed coordinator, medical advisor, and consultant to the Department of Civil Defense of the state of Alabama.——M. Michael Sigel, Ph.D., formerly head of the diagnostic unit, Virus and Rickettsia Section, Communicable Disease Center, U. S. Public Health Service, Montgomery, has been appointed associate professor of bacteriology at the University of Miami School of Medicine, Coral Gables, Fla.——Dr. John I. Mitchell, Haleyville, recently retired at the age of 76, after 42 years of medical practice. Dr. Mitchell served three months as mayor of Haleyville in 1902. He holds citations signed by General Hershey and former presidents Franklin D. Roosevelt and Harry Truman for services rendered in examining applicants for the armed forces during World War II.——Capt. James T. Grimes of Enterprise was awarded the Commendation Ribbon with Medal Pendant on his release from military service at Fort McClellan March 31. The citation acclaimed his initiative and his organizational and administrative ability in planning and operating specialized treatment centers at the Fort McClellan military hospital. Dr. Grimes plans to resume private practice, specializing in internal medicine, at the Gibson Hospital and clinic at Enterprise.——At its 40th anniversary meeting the Alabama Tuberculosis Association honored Drs. Joseph D. Heacock and Cabot Lull of Birmingham for their "service to mankind." Both physicians were founders of the association. Dr. Heacock served as its president from 1926 to 1928. Dr. Lull, who has served continuously on the board of directors since 1914, became medical director of the Jefferson County Antituberculosis Association in 1910 and served without pay until he retired in 1950.

ARIZONA

State Medical Election.—Newly elected officers of the Arizona Medical Association, Inc., include: Dr. Harry E. Thompson, Tucson, president; Dr. Abe I. Podolsky, Yuma, president-elect; Dr. Carlos C. Craig, Phoenix, vice-president; Dr. Dermont W. Melick, Phoenix, secretary; and Dr. Clarence E. Yount Jr., Prescott, treasurer.

CALIFORNIA

Pediatric Accident Prevention Program.—The University of California School of Medicine, Los Angeles, has launched a training program in accident prevention under the direction of Drs. John M. Adams and Harry F. Dietrich of the pediatrics department, seeking to make future physicians accident-hazard conscious. In commenting on the new program Dr. Dietrich pointed out that many of the more than 10,000 fatal accidents and the more than 40,000 crippling accidents among children could be eliminated annually if as much attention were devoted to accident prevention as to disease prevention.

Society News.—Newly elected officers of the Los Angeles Society of Ophthalmology and Otolaryngology include Dr. Robert A. Norene, president, and Dr. Leland R. House, secretary-treasurer.——Newly elected officers of the San Francisco Dermatological Society include Dr. Paul Fasal, San Rafael, president; Dr. George T. Lenahan, San Francisco, vice-president; Dr. R. Raymond Allington, Oakland, secretary; and Dr. Edward J. Ringrose, Berkeley, editor.——The American Cancer Society's Los Angeles county branch has received a special award from the CIO for "outstanding contribution towards improving relations between community agencies and organized labor through unprejudiced servicing of the human needs of the community at large." Through its service program, the American Cancer Society assists CIO members who are cancer victims by supplying drugs, dressings, nursing, or similar care.

Symposium on Fungous Diseases.—A symposium on new research in treatment of fungous diseases and associated basic research will be presented at the University of California in Los Angeles under the combined auspices of the U. C. L. A. division of dermatology, school of medicine, and medical extension of the University Extension, June 23-25. The meeting is made possible through financial assistance from the Squibb Institute of Medical Research. Selman A. Waksman, Ph.D., of Rutgers University, New Brunswick, N. J., Nobel prize winner in medicine, will be guest of honor and dinner speaker at a banquet at the Beverly Hills Hotel on Thursday. The symposium will be divided into five sessions under the following chairmen: Chester W. Emmons, Ph.D., National Institutes of Health, Bethesda, Md.; Dr. Harvey Blank, Squibb Institute of Medical Research, New Brunswick, N. J.; Dr. Arthur C. Curtis, Ann Arbor, Mich.; Norman F. Conant, Ph.D., Duke University School of Medicine, Durham, N. C.; and Dr. Donald M. Pillsbury, University of Pennsylvania School of Medicine, Philadelphia. With attendance by invitation only, inquiries should be forwarded to Dr. Thomas H. Sternberg, Assistant Dean for Postgraduate Medical Education, University of California Extension, Los Angeles 24.

CONNECTICUT

Dr. Barker Receives Cancer Award.—Dr. Creighton Barker, New Haven, executive secretary of the Connecticut State Medical Society, has received the 1955 medal for distinguished service in cancer control, the highest annual award of the Connecticut division of the American Cancer Society. Dr. Barker has been actively associated with the work of the cancer organization since he served as one of its original incorporators 18 years ago.

Society News.—The Connecticut committee of the National Society for the Prevention of Blindness, which received its charter from the national society in March, held its first annual meeting May 2, at which time the following officers were elected: Mr. Stanley F. Withe, Hartford, president; Ira V. Hiscock, M.P.H., New Haven, vice-president and consultant; and Dr. Eugene M. Blake, New Haven, vice-president and medical director.

DISTRICT OF COLUMBIA

Former Intern Appointed Dean of Howard.—Dr. Robert S. Jason, recently appointed dean of the Howard University College of Medicine, Washington, D. C., is a graduate of Lincoln University in Lincoln University, Pa., and the Howard medical school. For the past 20 years he has served as recording secretary and assistant recording secretary of the Association of Former Internes and Residents of Freedmen's Hospital. At the time of his elevation to the deanship, he was vice-dean and professor of pathology at the medical school.

Society News.—Members of the Washington Psychiatric Society and the Washington metropolitan district branch of the American Psychiatric Association have voted to combine organizations, effective July 1. The new organization will be known as the Washington Psychiatric Society, a district branch of the A. P. A. Officers elected at the meeting of the Washington Psychiatric Society (Dr. Marshall deG. Ruffin, president; Dr. Winfred Overholser, president-elect; Dr. Marvin L. Adland, Rockville, Md., secretary; and Dr. Norman Taub, treasurer) were also unanimously elected as officers of the metropolitan district branch.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

Personal.—Dr. Francis Thomas Coleman has been appointed medical director of Catholic University of America, Washington, D. C., succeeding the late Dr. John A. Simpson, who died Oct. 26, 1954.——Dr. William Foster Burdick has been named chief of the medical staff of Children's Hospital, Washington, D. C., succeeding the late Dr. Hugh J. Davis. Dr. Burdick is clinical professor of pediatrics at the Georgetown University School of Medicine.——Dr. Jeanne C. Bateman, Washington, D. C., discussed her work in cancer chemotherapy at the Radiumhemmet in Stockholm, Sweden, during March, at the invitation of Dr. Sven Hultberg, director of Karolinska Institute. While in Europe she visited cancer hospitals in Germany and Italy.

ILLINOIS

State Medical Election.—Dr. F. Garm Norbury, Jacksonville, was recently installed as president of the Illinois State Medical Society; Dr. F. Lee Stone, Chicago, was named president-elect; Dr. C. Elliott Bell, Decatur, first vice-president; Dr. Maurice M. Hoeltgen, Chicago, second vice-president; and Dr. Harold M. Camp, Monmouth, secretary-treasurer.

Rehabilitation Institute.—Vocational counselors, social workers, occupational therapists, health educators, and administrators of health and welfare agencies will participate in the second annual Rehabilitation Institute, June 20 to July 1, at Southern Illinois University, Carbondale. Plans for the program have been made by the university in cooperation with the Illinois Tuberculosis Association and the Illinois division of vocational rehabilitation. Sessions will stress clarification of the scope of rehabilitation, rehabilitation as a process and an integration of specific services adapted to individual needs, understanding of human behavior and the difference between true psychoses and normal reactions to abnormal situations, and use of agency services and the importance of community awareness of responsibilities to the handicapped. The cost of the entire session including tuition, room, and board will be $66. Primary requirements for admission are employment in one of the many phases of rehabilitation service or a personal interest in the problems of the handicapped. Participants may apply for graduate or undergraduate credit, or they may audit. Information may be obtained from Illinois Tuberculosis Association, 730 S. Sixth St., Springfield.

Chicago

Prize in Multiple Sclerosis.—A Harry Abrahams Prize in Multiple Sclerosis in the sum of $350 has been established by Dr. Samuel Abrahams in honor of his brother, Mr. Harry Abrahams. This fund is to be used as an award for papers on studies in multiple sclerosis submitted by any person in training. The first prize is $200 and the second prize, $150. Anyone interested in submitting such a manuscript should write to the Secretary of the Chicago Neurological Society, Dr. Oscar Sugar, 912 S. Wood St., Chicago 12. The winning papers will be read at one of the regular meetings of the society.

Research in Rheumatic Fever.—The Samuel Sackett Foundation, established recently for scientific research, has selected as its first project an investigation of rheumatic fever and its related diseases, which will be conducted in Northwestern University Medical School. Studies will be supported by income from the $500,000 foundation created by Mr. and Mrs. Samuel J. Sackett, Evanston, Ill., and their daughter, Mrs. Elizabeth Sackett Crocker, Houston, Texas. Foundation trustees are Mr. Sackett; Mr. Frank T. Murray, Chicago attorney; and Dr. Lowell D. Snorf, professor of medicine, Northwestern University Medical School. Laboratory facilities for the studies will be provided in the new Morton Medical Research building at the Northwestern Medical Center on the university's Chicago campus. A broad and continuing investigation is planned, rather than any specific study related to a limited aspect of rheumatic fever.

University News.—The following promotions on the faculty of the Chicago Medical School have been announced by Dr. John J. Sheinin, president: Dr. Aaron Grossman to associate professor of pediatrics; Dr. Lloyd H. Grundset to assistant professor of medicine; Dr. Russell von Milliser of Elmhurst to professor of pathology; Dr. Irving Wolin to clinical associate professor of orthopedic surgery; Dr. Allan B. Hirschtick to clinical assistant professor of orthopedic surgery; and Dr. LeRoy P. Levitt to assistant professor of psychiatry. Recent appointments to the faculty include Dr. Frank E. Rubovits, clinical assistant professor of gynecology and obstetrics; Dr. Jerome J. Moses, clinical associate in surgery; Dr. Carl Weiner, clinical assistant in medicine; Dr. Irene Kuras, clinical assistant in pediatrics; Dr. John McAllister, clinical assistant in psychiatry; Dr. Walter Indeck, clinical instructor in orthopedic surgery; Dr. Philip Falk, instructor in orthopedic surgery; and Dr. Minnie Frank, clinical assistant in pediatrics.

LOUISIANA

Society News.—Newly elected officers of the recently organized New Orleans Pediatric Society include: Dr. Joseph D. Russ, president; Dr. Joseph M. Perret Jr., vice-president; Dr. George J. Fruthaler, secretary; and Dr. Thomas E. Furlow, treasurer.

Course in Parasitology.—The Louisiana State University School of Medicine, New Orleans, will present a short intensive course on the laboratory diagnosis and pathology of parasitic infections Aug. 15-27. The course, designed primarily for pathologists and technologists, is open also to physicians. The instruction and training, which will be of assistance to pathologists who are preparing for board examinations, to pathologists and physicians who are responsible for the diagnosis of parasitic infections in their laboratories, and to technologists engaged in this specialty, will include lectures, extensive demonstrations, films, and supervised individual laboratory study. Emphasis will be placed on the practical aspects of laboratory diagnosis of common parasitic infections, including training in stool examination and stool concentration techniques. Registrants should bring microscopes, equipped with mechanical stages, and microscope lamps. A limited number of places will be available. The fee for the course is $50. Information may be obtained from J. Clyde Swartzwelder, Ph.D., Department of Microbiology, Louisiana State University School of Medicine, 1542 Tulane Ave., New Orleans 12.

MARYLAND

Society News.—Dr. Walter B. Martin, Norfolk, Va., was recently elected president of the Johns Hopkins Medical and Surgical Association; Drs. James Heyward Gibbes, Columbia, S. C., and Merrill C. Sosman, Boston, vice-presidents; Dr. R. Carmichael Tilghman, Baltimore, reelected secretary-treasurer; and Dr. Edward S. Stafford, Baltimore, reelected associate secretary-treasurer.

Dr. McCollum Honored.—A portrait of Elmer Verner McCollum, Ph.D., professor emeritus of biochemistry at the Johns Hopkins University, Baltimore, was recently presented to the university's Welch Medical Library by colleagues, former students, and friends. At the presentation ceremonies two of Dr. McCollum's closest friends, Dr. Edwards A. Park, professor emeritus of pediatrics at the Johns Hopkins University School of Medicine, and Lowell J. Reed, Ph.D., president of the Johns Hopkins University, spoke about him.

MASSACHUSETTS

Chaplains Honor Dr. Pratt.—To commemorate Dr. Joseph H. Pratt's 50th anniversary as a pioneer in group therapy, an all-day meeting will be sponsored in Posner Hall at the New England Medical Center, Boston, June 20, by the chaplains of hospitals in New England under the supervision of the Massachusetts Council of Churches. A demonstration and panel discussion on group therapy are planned for the morning session and presentation of recent advances in the field of group therapy for the afternoon. There will be a dinner meeting at 6:30 p. m.

Research Program on Trachoma.—The Arabian American Oil Company announces the undertaking of a five year, $500,000 research program with the Harvard School of Public Health, Boston, on the prevention of trachoma. The Arabian American Oil Company will contribute $100,000 annually and will make available the facilities of its new medical center in Dhahran, Saudi Arabia. A large part of a second floor wing of the

V 15
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Dhahran health center, including three modern laboratories, has been reserved for the project. Harvard University will provide the professional and technical staff for studies in the Middle East and in its laboratories at Boston. The research group will be directed by Dr. John C. Snyder, recently appointed dean of the school of public health.

MICHIGAN

Camp for Diabetic Children.—From Aug. 27 to Sept. 5 the Michigan Diabetes Association will sponsor a camp for diabetic children, aged 6 to 13 years. Physicians having interested patients should call Te 3-4000, Ext. 281, in Detroit.

Geriatrics Conference.—The University of Michigan will hold its Eighth Annual Conference on Aging, in Ann Arbor, June 27-30. Emphasis will be placed on a number of special "learning-how-to-do-it shops," each of which will be staffed by nationally known leaders and research personnel. The following four workshops or short courses of instruction will deal with the health problems of the aging: 1. Getting better medical care services for older people. 2. Adaption of rehabilitation to the needs of the aging. 3. Health maintenance in later maturity. 4. Planning for the mental health of the aging.

MISSOURI

Practitioner Retires.—Dr. Carlie Souter Smith, Springfield, a past-president of the Greene County Medical Society and of the Kansas City Eye, Ear, Nose and Throat Society, retired from the practice of medicine on May 1. Dr. Smith is chairman of the committee on conservation of eyesight of the Missouri State Medical Association and is on the Missouri committee of the National Society for the Prevention of Blindness. She is a member of the board of trustees of the Springfield Baptist Hospital and on the staff of all three of the Springfield hospitals. In 1951 the Springfield women's civic clubs named her the woman of achievement for that year. On April 5 Dr. Smith was reelected as a member of the city council, receiving more votes than any other candidate for the member-at-large position she fills on the council.

MONTANA

Medical-Surgical Conference.—The Cascade County Medical Society will present its sixth annual Medical-Surgical Conference June 20-21 at the Meadow Lark Country Club in Great Falls. The theme will be the application of new knowledge to every day practice.

General Practitioners Meet in Anaconda.—The Montana chapter of the American Academy of General Practice will hold its annual meeting in Anaconda, June 24, at the Montana Hotel. Out-of-state speakers include Dr. Maxwell M. Wintrobe, professor, department of internal medicine, University of Utah School of Medicine, Salt Lake City; Dr. Roger Anderson, Seattle; and Dr. Lester R. Dragstedt, chairman, department of surgery, University of Chicago School of Medicine. Dr. Josiah J. Moore, Chicago, Treasurer of the American Medical Association, will be the guest speaker at the banquet in the evening. There will be a registration fee of $10 for the course of instruction. During the scientific session there will be a luncheon, style show, bridge, and golfing at the Anaconda Country Club for the ladies. A guided tour through the Anaconda Copper Company smeltery has also been planned.

NEW JERSEY

Civic Award to Physicians' Chorus.—The Newark Unico chapter of the Unico National Service Club recently presented to the Doctors' Chorus a plaque inscribed "Awarded to the Doctors' Chorus of the Essex County Medical Society in recognition of their donation of time and talent for community services." Dr. Daniel E. Kavanaugh, Newark, is president of the Doctors' Chorus and Dr. Anthony S. Giannotto, Newark, president of Newark Unico.

Physicians Placement Service.—Through its Physicians Placement Service, the Medical Society of New Jersey maintains listings of New Jersey communities in need of physicians and of practicing physicians who are looking for assistants, associates, or temporary replacements. Physicians seeking locations may register without charge and receive information on possible locations for practice. The service is operated from the executive offices of the state medical society at 315 W. State St., Trenton 8. Physicians are invited to call or write for information.

Dr. Trussell Appointed to Columbia Posts.—Dr. Ray E. Trussell, director of the Hunterdon Medical Center in Flemington, and since 1951 clinical professor of preventive medicine at the New York University-Bellevue Medical Center, has been appointed the first executive officer of the newly organized School of Public Health and Administrative Medicine at Columbia University and has been named DeLamar Professor of Administrative Medicine and associate dean for public health in the faculty of medicine. Dr. Trussell, whose appointment becomes effective July 1, will direct a school that for 24 years was known as the DeLamar Institute of Public Health and, since 1945, has been called the School of Public Health.

NEW YORK

Cancer Committee Fellowship.—Dr. Edward C. Veprovsky of Flushing, president of the Queens County committee of the American Cancer Society, has issued a second call for applicants for a full-time fellowship worth $3,600 to be awarded by the Queens committee. The full-time fellowship will be established at the Queen General Hospital in gynecology, gynecologic pathology, radiation therapy, and isotope research. The fellowship will begin July 1, or earlier, if a suitable candidate can be obtained before that time. Inquiries should be addressed to Dr. Edward C. Veprovsky, President, Queens County Cancer Committee, 116-55 Queens Boulevard, Forest Hills 75, N. Y., Attention: Fellowship Committee.

Dr. Meade Joins Mine Workers Fund Staff.—The United Mine Workers of America Welfare and Retirement Fund has announced that Dr. Gordon Montgomery Meade, executive director, Trudeau-Saranac Institute, Saranac Lake, joined the staff of the Memorial Hospital Association, May 16. Dr. Meade will first be assigned to the Washington office of the association as a clinical consultant to assist in development of the medical program, in which 10 new hospitals designed primarily for beneficiaries of the fund are moving toward completion in the bituminous coal fields of West Virginia, Kentucky, and Virginia (THE JOURNAL, March 27, 1954). With the opening of the Williamson Memorial Medical Center at Williamson, W. Va., in January, 1956, Dr. Meade will become chief of clinical services, with responsibility for coordinating medical care, teaching, and clinical investigation for the Williamson Memorial Medical Center, as well as for the three other hospitals in the Williamson group located at Man, W. Va., Pikeville, Ky., and McDowell, Ky. Dr. Meade served as assistant director of the Strong Memorial Hospital, director of the tuberculosis control program at the University of Rochester, and assistant professor of medicine; also as assistant professor of medicine at the University of Vermont College of Medicine, Burlington, and special consultant to the division of hospitals, U. S. Public Health Service. He has been at Trudeau since 1946.

Personal.—Dr. Saul S. Samuels has been appointed consultant in vascular surgery to the Long Beach Memorial Hospital, Long Beach.——Dr. Orren D. Chapman, chairman, department of microbiology at State University of New York College of Medicine at Syracuse, has gone to Amman, Jordan, on a two year leave of absence to work with the U. S. Public Health Service, which has assigned him as chief of cooperative health and sanitation in Jordan. En route he stopped in London to confer with the Minister of Health and the dean of the London School of Tropical Medicine; in Geneva, Switzerland, to confer with the director and the assistant director general of the World Health Organization; at Cairo, Egypt, to see the chief of public health for Egypt; and at Alexandria, where he visited the regional office of WHO.——Dr. Newton J. Bigelow, Marcy, recently resigned as commissioner of mental hygiene and was reinstated as director of Marcy State Hospital. Dr. Bigelow has been affiliated with the New York state department of mental hygiene since 1929. Deputy commissioner Dr. Arthur W. Pense has been

named acting commissioner.——Dr. William A. Sawyer, Rochester, who has served as Chairman of the A. M. A. Committee on Medical Care for Industrial Workers and medical consultant to the International Association of Machinists, was the guest speaker at the annual meeting of the Cleveland Academy of Medicine May 20. His subject was "Sociological Trends in Medical Practice."

New York City

Course in Industrial Medicine.—A comprehensive eight week course in industrial medicine for physicians will be given in the Post-Graduate Medical School of New York University–Bellevue Medical Center commencing Sept. 26. Among the subjects offered will be organization, administration, and economics of an industrial medical department; the practice of preventive and constructive medicine in industry; the clinical aspects of occupational diseases; industrial injuries and the elements of safety programs; and toxicology and industrial hygiene for the physician. Opportunities will be provided for attendance at medical, surgical, and clinical pathological conferences during the course. Tuition is $250. Applications should be sent to the Dean, N. Y. U. Post-Graduate Medical School, New York 16.

Death of William Schieffelin.—William Jay Schieffelin, Ph.D., retired chairman of the board of Schieffelin and Co., died April 29 at the age of 89 after a long illness. Since he was 23 years old, he had been active in his family's drug business, founded in 1794 by his great-great-grandfather. Dr. Schieffelin, who had served as a trustee of Hampton Institute, Tuskegee Institute, and president of the National Wholesale Druggists' Association, was honorary president of the College of Pharmacy of Columbia University and president of the American Leprosy Mission. In addition to his business and political activities, Dr. Schieffelin had shown great interest in movements for the betterment of working conditions in New York factories and for the welfare of Negroes. He was instrumental in the formation of the Board of Sanitary Control in the garment industry, which led to the abolition of the sweatshop.

Opening of Rehabilitation Center.—The Children's Rehabilitation Center at the Bird S. Coler Hospital, Welfare Island, will be officially opened at 10:30 a. m. June 21. The unit, an inpatient rehabilitation service for severely handicapped children, aged 6-21, is sponsored jointly by New York Medical College, department of physical medicine and rehabilitation, and United Cerebral Palsy of New York City, Inc., in conjunction with the New York City departments of health and hospitals. It is equipped to give complete care, rehabilitation, and education to 84 severely handicapped children suffering from neuromuscular and musculoskeletal disorders. A research and training program for medical students, residents, therapists, and nurses is carried on under the supervision of New York Medical College. Physicians participating in the opening ceremonies will include: Philip J. Kahan, medical superintendent, Bird S. Coler Hospital; Basil C. MacLean, commissioner, Department of Hospitals; Leona Baumgartner, commissioner, Department of Health; Ralph E. Snyder, dean, New York Medical College Flower and Fifth Avenue Hospitals; and Jerome S. Tobis, director, department of physical medicine and rehabilitation, New York Medical College Flower and Fifth Avenue Hospitals. A tour through the facilities will be conducted by therapists of the hospital. Refreshments will be provided by the Suburban League for Cerebral Palsy, an affiliate of the women's division, United Cerebral Palsy of New York City, Inc.

OHIO

Medicolegal Conference.—The Law-Medicine Center of Western Reserve University, Cleveland, will present its second annual Institute on Science in Law Enforcement June 20-25. A series of seven lectures will be given by Commander George H. Hatherill of London, England, head of the Scotland Yard criminal investigation department, whose topics will be The Police Officer and His Scientific Aids; Murder and Circumstantial Evidence of a Scientific Nature; Practical Problems in Interrogation at Scotland Yard; Modern Methods of Burglars and Shopbreakers in England; Surveillance in England; and Prevention of Crime and the Cooperation of the Public. An additional talk on the history of Scotland Yard will be given by Commander Hatherill at the main dinner meeting of the course. There will be 22 other lecturers from Western Reserve University, the Cuyahoga County (Cleveland) coroner's office and laboratory, and the Cleveland police department, who will present lectures and demonstrations in the fields of pathology of homicide, investigation of crime scenes, surveillance and communications, science laboratory and gunnery, interrogation, trace evidence, and narcotics. Other special events during the week-long study program will include demonstrations at the Cleveland police department's science laboratory and gunnery range and at the new Cuyahoga County coroner's office, which adjoins the Western Reserve campus. Leaders of a crime solution clinic will discuss factual data involving detection and solution of specific crimes. Registration will be limited to 125 law enforcement officers. Tuition has been set at $75 (U. S. currency), with campus housing available at a new residence hall for an additional $15 for the entire institute week.

Personal.—Dr. Leo Rosenberg, director of physical medicine at Brown Hospital, a unit of the Dayton Veterans' Administration center, was recently awarded the community's employ-the-handicapped (EPH) citation for 1954. The presentation was made by Dr. Kenneth D. Arn, Dayton, at a kickoff dinner given by the Standard Register Company to 100 civic, state, and national representatives for EPH week.——Dr. Chandler A. Stetson Jr., assistant professor of preventive medicine at Western Reserve University School of Medicine, Cleveland, has been named associate professor of pathology of New York University College of Medicine, a unit of the New York University-Bellevue Medical Center. Since 1951 Dr. Stetson has held the post of established investigator of the American Heart Association.——Dr. Gertrude Felker, who retired in 1953 after a 50 year career, was named "the 1954 Woman of the Year" by the Dayton Business and Professional Women's Club. Dr. Felker, who is said to be the first woman physician to practice in Dayton and one of the first in the United States, has been a determined pioneer in promoting the public health of the community, starting with a clean milk campaign long before the days of pasteurization.——Dr. Andre Crotti, Columbus, has retired at the age of 81 after more than 50 years of practice. Dr. Crotti, first United States president of the International College of Surgeons and its second international president, is now a professor emeritus of the college. ——Dr. Stuart R. Ducker, formerly of Stony Point, N. C., has been named director and chief psychiatrist for the $75,000 adult guidance center located on state-owned grounds at 123 Wilmington Ave., Dayton. As first full-time director of the unit, Dr. Ducker will (1) direct psychiatric counseling and treatment for persons with emotional problems and for those mentally disturbed but not ill enough to be hospitalized and (2) start a program designed eventually to make this a psychiatric training center for Ohio.——Dr. Thomas H. Ham, professor of medicine and chairman of the committee on medical education at Western Reserve University School of Medicine, Cleveland, has been appointed to the National Advisory Health Council, where he will advise and make recommendations to the Surgeon General of the Public Health Service regarding grant activities of the National Microbiological Institute, Bethesda, Md. The council also advises the Surgeon General concerning grants in certain general areas of research and public health not covered by a specific institute. On recommendations of the council, established by act of Congress, the Surgeon General awards grants to scientists in universities and other nonfederal institutions conducting research in the foregoing fields.

PENNSYLVANIA

Study on Nicotine.—Studies of the pharmacology of nicotine and related alkaloids will be made by Dr. Carl C. Gruhzit, associate in physiology and pharmacology in the University of Pennsylvania Graduate School of Medicine, Philadelphia, under a $13,915 grant from the Tobacco Industry Research Committee.

New Professional Program for Hospitals.—Pennsylvania Hospital, Eighth and Spruce streets, Philadelphia, has inaugurated a new professional program under a grant from the Hartford Foundation. According to a recent announcement, the program

V 1
195

will be of particular interest to the general practitioners of the eastern half of Pennsylvania, the eastern shore of Maryland, southern New Jersey, and the state of Delaware. A primary aim is the strengthening of the clinical-educational liaison between the referring physician and his hospital by means of appropriate progress reports, discharge summaries, and invitations to follow his patient's clinical course at operation, on rounds, or at the bedside. In addition, daylong visiting consultant programs are planned for outlying hospitals throughout the geographical area, as well as practical postgraduate institutes to be offered at Pennsylvania Hospital. Refresher courses for laboratory technicians will be offered, with the program underwriting all expenses. A free quarterly bulletin, *Pennsylvania Hospital Practitioner,* will contain an outline of scheduled functions as well as articles of general medical interest. Coordination will be through county and state medical societies. Accreditation for general practitioners will be negotiated through the American Academy of General Practice. Dr. Caryl A. Potter Jr., coordinator of professional affairs, will direct the program.

Philadelphia

Grant for Cardiac Research.—A grant of $110,000 has been awarded the Hahnemann Medical College and Hospital of Philadelphia by the National Heart Institute to cover a three year period of research in coronary artery disease. The institute was formed to correlate information related to heart and circulatory diseases gained through separate studies among the various major specialties in medical science at Hahnemann.

Gifts to Woman's Medical College.—The Woman's Medical College of Pennsylvania recently received $55,000 from Messrs. Lloyd E. Riegler and Lawrence E. Deutsch, Los Angeles, to establish a fellowship in preventive medicine, honoring Lois Mattox Miller, and $10,000 from the estate of Mr. Gaston F. DuBois, former president of Monsanto Chemical Company, St. Louis, "for investigation of emphysema," the disease which claimed his life.

TENNESSEE

Award to Dr. Goodpasture.—The University of Chicago recently presented its annual Howard Taylor Ricketts award to Dr. Ernest W. Goodpasture of Vanderbilt University School of Medicine, Nashville, in recognition of his outstanding contributions to the field of virus and rickettsial diseases. Dr. Goodpasture spoke to the students and faculty on "Host Cell Responses to Viral Mutants as Exemplified by Fowl Pox."

Personal.—Dr. Alfred P. Kraus, assistant director of the department of medical laboratories of the University of Tennessee College of Medicine, Memphis, will depart on a year's leave of absence July 1 for the University of Indonesia in Djakarta, where he will become visiting assistant professor of hematology under a University of California-University of Indonesia project in medical education, sponsored by the State Department.——Dr. James G. Hughes, professor of pediatrics at the University of Tennessee College of Medicine, Memphis, has been selected by the World Health Organization to conduct a study of the pediatric departments of the medical schools in Latin America and to evaluate the status of training in the diseases of infancy and childhood in the areas visited. During July he will visit the medical schools of Mexico and Central America and in the fall, those of South America and the Caribbean.

University News.—Dr. Gene M. Lasater, who was chief of the neurological section of the Fifth General Hospital, U. S. Army Medical Corps, in Stuttgart, Germany, from 1951 to 1953, has been appointed as full-time assistant professor in the department of neurology and psychiatry at the University of Tennessee College of Medicine, Memphis, to assist in teaching neurology and conduct research in nervous diseases.——Nicholas R. DiLuzio, Ph.D., has joined the division of physiology, University of Tennessee Medical Units, Memphis, as an instructor. Dr. DiLuzio for the past six months had been an investigator at the Dorn Laboratories for Medical Research at the Bradford (Penn.) Hospital.——The University of Tennessee College of Medicine, Memphis, announces a six month course for high school graduates who wish to become physicians' office assistants. Registration will be held July 7. Classwork will begin July 11 and end Dec. 17. Students will be taught the routine laboratory procedures used in physicians' offices. Further information may be obtained from the university's Institute of Pathology, 858 Madison, Memphis.

WEST VIRGINIA

Seminar on Gastroenterology.—A seminar, "Diagnosis and Treatment of Common Diseases of the Gastrointestinal Tract," will be sponsored by the medical staff of the Broaddus Hospital, July 15-16, at Philippi. Dr. Thomas E. Machella, chief, gastrointestinal section, medical clinic, Hospital of the University of Pennsylvania, Philadelphia, will be the guest speaker. Full information concerning the program may be obtained by writing the Administrator, Broaddus Hospital, Philippi.

Personal.—Dr. James H. Walker, Charleston, who has been serving as part-time medical consultant to the bureau of tuberculosis control of the state department of health, has accepted appointment as part-time director of the bureau.——The honorary degree of doctor of humane letters was conferred on Dr. William Ramsey Laird, Montgomery, at a convocation held recently at Salem College under the joint sponsorship of the college and the American Humanics Foundation. Former Congressman Jennings Randolph, vice-president of the Capital Airlines and a member of the board of directors of Salem College, presented Dr. Laird with his degree, which was bestowed "because of his distinguished and unselfish service to his fellowman."——Dr. Mayes B. Williams, Wheeling, has been named by Gov. William C. Marland as a member of the advisory board to the state board of health.

Society News.—Newly elected officers of the West Virginia Academy of General Practice include: Dr. Logan W. Hovis, Parkersburg, president; Dr. Don S. Benson, Moundsville, vice-president; and Dr. Halvard Wanger, Shepherdstown, president-elect.——Mr. Alan Bernstein, a student at Morgantown High School, has received the 1955 West Virginia State Medical Association award ($25) for "streptomycin," the best paper on a medical subject submitted by a member of the Junior Academy of Science during a school year.——Dr. James L. Patterson, Logan, has been named chairman of the new West Virginia State Medical Association committee on medicopharmaceutical relations, of which the other members are Drs. Henry C. Hays, Williamson; William H. Allman, Clarksburg; Earl L. Fisher, Gassaway; and Buford W. McNeer, Hinton. The committee will meet frequently with a similar committee from the state pharmaceutical association for the purpose of "airing problems and attempting to correct them, thereby bringing about better medico-pharmaceutical relations."——The annual scientific meeting and golf tournament of the Preston County Medical Society will be held at the Preston Country Club, near Kingwood, June 23. Frequent tours of the new Preston County Memorial Hospital are planned. Dr. Louis A. M. Krause, Baltimore, will be the guest speaker at the banquet scheduled for 7 p. m. There will be a cocktail hour beginning at 5 p. m. The golf tournament will get under way at 9 a. m. A trap shooting tournament is scheduled to begin at 1 p. m. Interested physicians should bring their own guns and shells. Fishing trips during the day may be arranged to nearby trout streams and lakes. The registration fee is $6.

WISCONSIN

Councilor District Meeting.—The Fifth Councilor District annual meeting will convene June 23, 2 p. m., at the Hotel Hamilton, Two Rivers. A question-and-answer period will follow the afternoon program, which will be presented by faculty members of the Northwestern University Medical School, Chicago, new developments in medicine being reported by Dr. Nathan Smith Davis; in surgery by Dr. Earl O. Latimer; and in obstetrics and gynecology by Dr. Ronald R. Greene. A cocktail hour, 5:30-6:30 p. m., will precede the banquet. The charge per person will be $5. The meeting is open also to those not residing in the

councilor district. Reservations with accompanying checks should be mailed to Dr. Wallace Marshall, Secretary, Bank of Two Rivers Building, Two Rivers, by June 20.

Symposium on Office Procedures and Clinical Medicine.—Physicians and their wives are invited to attend a symposium on office procedures and clinical medicine that will be held June 24 at the new East Side Business Men's Club on Lake Monona, Madison, under the joint auspices of the Wisconsin Academy of General Practice and Lederle Laboratories Educational Services. A half hour of questions and panel discussion will follow the morning program, 10 a. m. to 12 noon, and the afternoon program, 2:30-4:45 p. m. The program will include:

Management of Fractures of Extremities About the Joints, Paul A. Pemberton, associate professor of surgery, University of Utah School of Medicine, Salt Lake City.

Diagnosis of Poliomyelitis, Alexander J. Steigman, professor of child health, University of Louisville School of Medicine, Louisville, Ky.

Common Anorectal Disorders, Their Pathogenesis, Diagnosis, and Treatment, Jerrold P. Nesselrod, associate in surgery, Northwestern University, Evanston, Ill.

Office Management of Allergies, I. George Blumstein, assistant professor of medicine, Temple University School of Medicine, Philadelphia.

Management of the Oliguric Patient, Lewis W. Bluemle, associate in medicine, University of Pennsylvania School of Medicine, Philadelphia.

Infertility, Christopher J. Duncan, clinical associate in gynecology, Harvard Medical School, Boston.

Six hours' formal credit will be given for members of the Academy of General Practice. Luncheon is scheduled from 12:45 to 2:15 p. m. and cocktails from 5 to 6 p. m. A special program of entertainment has been arranged for the ladies.

HAWAII

Hawaii Medical Election.—Newly elected officers of the Hawaii Medical Association include: Dr. Clarence E. Fronk, Honolulu, president; Dr. A. Webster Boyden, Lihue, president-elect; Drs. Richard C. Durant, Honolulu, Theodore T. Oto, Hilo, A. Webster Boyden, Lihue, and Louis S. Rockett, Wailuku, vice-presidents; Dr. William S. Ito, Honolulu, secretary; and Dr. Hong Q. Pang, Honolulu, treasurer.

GENERAL

American Orthopaedic Association.—The 68th annual session of the American Orthopaedic Association will convene at the Greenbrier, White Sulphur Springs, W. Va., June 19-22, under the presidency of Dr. J. Warren White, Honolulu, Hawaii.

Meeting on Physical Therapy.—The 32nd annual conference of the American Physical Therapy Association will be held at the Hotel Jefferson, St. Louis, June 19-25. At the opening session Monday afternoon, the speaker will be Dr. Charles U. Letourneau, director, program in hospital administration, Northwestern University Medical School, Chicago.

Lecturer on Medical Writing.—Dr. Jacques P. Gray, director of special medical services and medical consultant of Parke, Davis & Company, has been appointed visiting lecturer on medical writing of the American Medical Writers' Association. Dr. Gray will give instruction in medical writing to medical students and to interns and residents in the leading teaching hospitals of the United States and Canada. The entire expense of this pioneer educational work in medical writing is to be borne by Parke, Davis & Company of Detroit.

Tom Spies Honored.—Dr. Tom D. Spies, head of the department of nutrition and metabolism at Northwestern University Medical School, Chicago, and director of the nutrition clinic, Hillman Hospital, Birmingham, Ala., has been awarded the rank of Comendador (Exalted Knight) in the Order of Honor and Merit of the Cuban Red Cross. Dr. Spies was decorated at ceremonies in Havana by Brig. Gen. E. Figarola Infante, president of the Cuban Red Cross, for his work in medical research in nutrition and metabolism and for his contributions toward eradicating tropical sprue.

Playtex Pediatric Grants.—The Playtex Park Research Institute, founded four years ago to support pediatric research, has announced a change in policy, whereby it will sponsor on a one to three year basis young investigators whose ideas and programs require financial support. The investigator must have demonstrated an aptitude for research, be associated with a recognized medical institution, and have a proposed program that the board of the institute considers promising. Detailed information as to grants and application forms may be obtained from the Playtex Research Institute, 6415 Empire State Bldg., New York City 1.

Tobacco Industry Offers Fellowships.—A fellowship program to stimulate interest in research among medical school students has been announced by the Tobacco Industry Research Committee. The fellowships are intended for regular or graduate students interested in devoting their summer or "off-term" time to basic research in experimental or clinical sciences. Each fellowship will provide $500 for the term. According to Dr. Clarence Cook Little, director of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, who is chairman of the Scientific Advisory Board, which determines the research policy and program for the Tobacco Industry Research Committee, and scientific director of the committee, no limitation of any kind will be placed on the field of research that may be selected within the areas designated.

Endocrine Society Scholarships.—The council of the Endocrine Society has established a category of scholars through grants made by the Schering Corporation and the Upjohn Company. Grants will be awarded to established investigators and teachers in the field of endocrinology who wish to extend their opportunities for work either in this country or abroad. The awards, not exceeding $2,500 annually for each candidate, will be granted on the basis of proposals submitted by the applicant. Such applications should include the estimated financial needs. Funds may be used for travel, maintenance, and other expenses. Proposals for appointments as scholars of the Endocrine Society, made in writing by the individual and addressed to the secretary of the society, Dr. H. H. Turner, 1200 N. Walker St., Oklahoma City, should be submitted by Nov. 1. Notice of awards to successful nominees and applicants will be made not later than Dec. 1 each year.

Awards for Graduate Training.—Mead Johnson and Company, Evansville, Ind., announces the following annual Mead Johnson Awards for Graduate Training, which are made available to promising young residents and interns in several of the larger fields of medical endeavor to help insure continuance of their training:

Mead Johnson Awards for Graduate Training in General Practice, available from the American Academy of General Practice. For information, write: Mr. Charles E. Nyberg, Executive Assistant, American Academy of General Practice, Broadway at 34th Street, Kansas City 11, Mo.

Mead Johnson Awards for Graduate Training in Internal Medicine, available from the American College of Physicians. For information, write: Mr. E. R. Loveland, Executive Secretary, American College of Physicians, 4200 Pine St., Philadelphia 4.

Mead Johnson Awards for Graduate Training in Obstetrics and Gynecology, available from the American Academy of Obstetrics and Gynecology. For information, write: Mr. Donald F. Richardson, Executive Secretary, American Academy of Obstetrics and Gynecology, 116 S. Michigan Ave., Chicago 3.

American Academy of Pediatrics Residency Fellowships in Pediatrics, available from the American Academy of Pediatrics. For information, write: Dr. E. H. Christopherson, Executive Secretary, American Academy of Pediatrics, 610 Church St., Evanston, Ill.

Mead Johnson Awards for Graduate Training in Surgery, available from the American College of Surgeons. For information, write: Dr. George W. Stephenson, Assistant Director, American College of Surgeons, 40 E. Erie St., Chicago 11.

Society News.—At the annual business meeting of the **American Psychosomatic Society** the following physicians took office: Stanley Cobb, Boston, president; I. Arthur Mirsky, Pittsburgh, president-elect. The next annual meeting will be held at the Sheraton Plaza, Boston, March 24-25, 1956.——Newly elected officers of the **American Academy of Occupational Medicine** include: Dr. Frank Princi, Cincinnati, president; Dr. Edgar E. Evans, Penns Grove, N. J., vice-president; and Drs. Irving R. Tabershaw, New York, and Leonard J. Goldwater, New York, reelected treasurer and secretary respectively.——At a recent meeting of the **American Otorhinologic Society for Plastic Sur-**

gery, Inc., the following officers were elected: Dr. Joseph G. Gilbert, Brooklyn, N. Y., president; Dr. Kenneth Hinderer, Pittsburgh, vice-president; Dr. Louis J. Feit, New York, secretary; and Dr. Armand L. Caron, Worcester, Mass., treasurer. ——The **North Pacific Society of Neurology and Psychiatry** recently elected the following officers: Dr. Wendell H. Hutchens, Portland, Ore., president; Dr. Donald E. Stafford, Seattle, president-elect; Dr. John W. Evans, Portland, Ore., secretary-treasurer.——Newly elected officers of the **Mid-Central States Orthopaedic Society** include: Dr. Elias Margo, Oklahoma City, president; Dr. J. Sims Norman, Pueblo, Colo., vice-president; and Dr. Harry O. Anderson, Wichita, Kan., secretary-treasurer. The third annual meeting will be held in Oklahoma City, April 20-21, 1956.——The **International Anesthesia Research Society** has canceled the 1955 Congress of Anesthetists, originally scheduled for Nov. 14 to 17 at Boca Raton, Fla. Because the meeting of the World Congress of Anesthesiologists will be held Sept. 5 to 10 in Scheveningen, Holland, the 30th Congress of Anesthetists of the International Anesthesia Research Society will be postponed until the spring of 1956. This congress will be held at the Flamingo Hotel, Miami Beach, Fla., March 12-15, 1956.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States and its territories and possessions in the weeks ended as indicated:

Area	May 28, 1955 Paralytic Type	May 28, 1955 Total Cases Reported	May 29, 1954, Total
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	..
Rhode Island	..	..	..
Connecticut	..	..	..
Middle Atlantic States			
New York	4	18	4
New Jersey	..	2	1
Pennsylvania	..	3	1
East North Central States			
Ohio	2	6	12
Indiana	..	1	..
Illinois	3	9	3
Michigan	2	4	8
Wisconsin	2	5	3
West North Central States			
Minnesota	2	3	1
Iowa	1	6	1
Missouri	..	1	5
North Dakota	..	..	..
South Dakota	2	6	..
Nebraska	1	3	1
Kansas	..	3	2
South Atlantic States			
Delaware	3	5	..
Maryland	6	7	..
District of Columbia	2	2	..
Virginia	..	4	4
West Virginia	2	2	4
North Carolina	3	4	..
South Carolina	..	1	2
Georgia	2	3	9
Florida	1	6	21
East South Central States			
Kentucky	4	6	3
Tennessee	..	3	2
Alabama	..	3	12
Mississippi	1	4	6
West South Central States			
Arkansas	1	2	11
Louisiana	9	11	10
Oklahoma	1	1	8
Texas	11	37	48
Mountain States			
Montana	1	1	..
Idaho	..	22	1
Wyoming	..	..	..
Colorado	1	5	1
New Mexico	..	..	2
Arizona	1	1	..
Utah	..	1	..
Nevada	..	..	..
Pacific States			
Washington	1	5	4
Oregon	5	6	3
California	11	28	43
Territories and Possessions			
Alaska	..	..	..
Hawaii	..	..	8
Puerto Rico	11	11	..
Total	96	251	244

CANADA

Annual Meetings.—The British Medical Association, the Canadian Medical Association, and the Ontario Medical Association will hold a conjoint annual meeting at the Royal York Hotel, Toronto, June 20-24. The subjects of the plenary sessions Monday and Wednesday will be "The Present Status of Chemotherapy of Bacterial Infections" and "The Clinical Application of Physiology to Medicine and Surgery" respectively.

The Canadian Academy of Allergy will hold its annual meeting June 21. The afternoon session will open with presentation of "The Clinical Aspects of Infection in Allergic Diseases" by Dr. Robert A. Cooke, New York City.

FOREIGN

Conference on Urinary Lithiasis:—The International Congress on Urinary Lithiasis, organized by the Medical Society of Evian, will be held at Evian, France, Sept. 2-4. Anatomic, biological, medical, and surgical reports will be presented. All scientific communications should be addressed to Prof. Claude Laroche, 16 rue Christophe-Colomb, Paris 8, before July 15. For information, write to Mr. Rossollin-Grandville, Direction de la Société des Eaux Minerales d'Evian, Evian (Hte Savoie), France.

David Anderson-Berry Prize.—A David Anderson-Berry silver-gilt medal, together with a sum of money amounting to about £100 ($279.63), will be awarded in 1956 by the Royal Society of Edinburgh to the person, who, in the opinion of the council, has recently produced the best work on the therapeutic effect of x-rays on human diseases. Applications for this prize are invited. They may be based on both published and unpublished work and should be sent, with copies of relevant papers, to the General Secretary, Royal Society of Edinburgh, 22,24 George St., Edinburgh, 2, by March 31, 1956.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1955 Clinical Meeting, Boston, Nov. 29-Dec. 2.

1956 Annual Meeting, Chicago, June 11-15.

1956 Clinical Meeting, Seattle, Nov. 27-30.

1957 Annual Meeting, New York, June 3-7.

AMERICAN ORTHOPEDIC ASSOCIATION, Greenbrier Hotel, White Sulphur Springs, W. Va., June 19-22. Dr. George O. Eaton, 4 East Madison St., Baltimore 2, Secretary.

IDAHO STATE MEDICAL ASSOCIATION, Sun Valley, June 19-22. Mr. Armand L. Bird, 364 Sonna Bldg., Boise, Executive Secretary.

MAINE MEDICAL ASSOCIATION, The Samoset, Rockland, June 19-21. Mrs. Esther M. Kennard, 142 High St., Portland 3, Secretary.

MEDICAL SURGICAL CONFERENCE, Great Falls, Mont., June 20-21. Dr. Carl Nelson, 600 Central Ave., Great Falls, Mont., Secretary.

NATIONAL MEDICAL ASSOCIATION, Los Angeles, Aug. 8-11. Dr. John T. Givens, 1108 Church St., Norfolk 10, Va., General Secretary.

POST GRADUATE MEDICAL ASSEMBLY OF SOUTH TEXAS, The Shamrock, Houston, July 18-20. Dr. C. Forrest Jorns, 412 Jesse H. Jones Library Bldg., Houston, Secretary.

ROCKY MOUNTAIN CANCER CONFERENCE, Shirley-Savoy Hotel, Denver, July 13-14. Dr. Frederick H. Brandenburg, 835 Republic Bldg., Denver 2, Chairman.

SYMPOSIUM FOR GENERAL PRACTITIONERS ON TUBERCULOSIS AND OTHER CHRONIC PULMONARY DISEASES, Saranac Lake, N. Y., July 11-15. Dr. Richard P. Bellaire, P. O. Box 2, Saranac Lake, N. Y., General Chairman.

FOREIGN AND INTERNATIONAL

AUSTRALASIAN MEDICAL CONGRESS, Sydney, N.S.W., Australia, Aug. 20-27. For information write: Federal Council of the B.M.A. in Australia, 135 Macquaire St., Syndey, N.S.W., Australia.

CANADIAN AND BRITISH MEDICAL ASSOCIATIONS, Joint Meeting, Toronto, Canada, June 20-22. Dr. Arthur D. Kelly, 244 St. George St., Toronto, Canada, General Secretary.

COMMONWEALTH HEALTH AND TUBERCULOSIS CONFERENCE, Royal Festival Hall, London, England, June 21-25. Mr. J. H. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1, England, Secretary General.

CONGRESS OF INTERNATIONAL ASSOCIATION OF APPLIED PSYCHOLOGY, London, England, July 18-23. Dr. C. B. Frisby, National Institute of Industrial Psychology, 14 Welbeck St., London, W.1, England, President.

CONGRESS OF INTERNATIONAL ASSOCIATION OF PSYCHOTECHNOLOGY, London, England, July 18-23. For information write: Dr. C. B. Frisby, Director, National Institute of Industrial Psychology, 14 Welbeck St., London, W.1, England.

CONGRESS OF INTERNATIONAL DIABETES FEDERATION, Cambridge, England, July 4-8. Mr. James G. L. Jackson, 152 Harley St., London, W.1, England, Executive Secretary General.

CONGRESS OF INTERNATIONAL SOCIETY OF SURGERY, Copenhagen, Denmark, July 23-29. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium, General Secretary.

INTERNATIONAL ACADEMY OF LEGAL AND SOCIAL MEDICINE, Plenary Conference, Genes, Italy, Oct. 13-17. Prof. Domenico Macaggi, Institut de Medicine legale, Universite de Genes, Genes, Italy, President.

INTERNATIONAL ANATOMICAL CONGRESS, Paris, France, July 25-30. Prof. Gaston Cordier, 45, rue des Saints-Pères, Paris 6e, France, Secretary General.

INTERNATIONAL CONFERENCE OF MEDICAL LIBRARIANS AND REFERENCE LIBRARIANS, University Hall, Brussels, Belgium, Sept. 10. For information address: Miss Ch. de Looze, Librarian de Oeuvre Nationale Belge de Defense contra la Tuberculose, 56, rue de la Concorde, Brussels, Belgium.

INTERNATIONAL CONGRESS OF ALLERGOLOGY, Rio de Janeiro, Brazil, S. A., Nov. 6-13. Dr. Bernard N. Halpern, 197 boulevard St. Germain, Paris 7e, France, Secretary General.

INTERNATIONAL CONGRESS OF ANGIOLOGY AND HISTOPATHOLOGY, Fribourg, Switzerland, Sept. 2-5. For information write: Dr. Gerson, 4 rue Pasquier, Paris 8e, France.

INTERNATIONAL CONGRESS OF BIOCHEMISTRY, Brussels, Belgium, Aug. 1-6. Prof. C. Liebecq, 17 Place Delcour, Liège, Belgium, Secretary General.

INTERNATIONAL CONGRESS OF CRIMINOLOGY, London, England, Sept. 11-18. For information write: Dr. Carroll, 28 Weymouth St., London, W.1, England.

INTERNATIONAL CONGRESS OF EUROPEAN SOCIETY OF HAEMATOLOGY, Freiburg i.Br., Germany, Sept. 20-24. Prof. Dr. L. Heilmeyer, Hugstetter Strasse 55, Freiburg i.Br., Germany, Chairman.

INTERNATIONAL CONGRESS OF INTERNATIONAL SOCIETY OF BRONCHOESOPHAGOLOGY, Buenos Aires, Argentina, S. A., Oct. 28-29. Dr. Juan Carlos Arauz, Cangallo 4015, Buenos Aires, Argentina, S. A., Secretary General.

INTERNATIONAL CONGRESS OF LIBRARIANSHIP AND DOCUMENTATION, Brussels, Belgium, Sept. 11-18. For information write: Dr. A. C. Breycha-Vauthier, Librarian, United Nations, Geneva, Switzerland.

INTERNATIONAL CONGRESS OF MEDICAL PROFESSIONAL JURISDICTION, MEDICAL ETHICS, AND COMPARATIVE MEDICAL LAW, Paris, France, Sept. 30-Oct. 3. Dr. J. R. DeBray, Conseil National de L'Ordre des Medécins, 60, Boulevard Latour-Maubourg, Paris 7e, France, Secretary General.

INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, Istanbul, Turkey, Aug. 28-Sept. 1. Dr. J. Voncken, International Committee of Military Medicine and Pharmacy, 79 rue Saint Laurent, Leige, Belgium, Secretary-General.

INTERNATIONAL CONGRESS OF NEO-HIPPOCRATIC MEDICINE, Montecatini, Terme, Italy, May 20-22, 1956. Prof. P. Delore, 13 rue Jarente, Lyon, France, Secretary-General.

INTERNATIONAL CONGRESS OF NEUROPATHOLOGY, London, England, Sept. 12-17. Dr. W. H. McMenemey Maida Vale Hospital for Nervous Diseases, London, W.9, England, Secretary.

INTERNATIONAL CONGRESS OF PLASTIC SURGERY, Stockholm, Sweden, Aug. 1-4, and Uppsala, Sweden, Aug. 5. Dr. Tord Skoog, Uppsala, Sweden, General Secretary.

INTERNATIONAL CONGRESS ON URINARY LITHIASIS, Evian, France, Sept. 2-4. Mr. Rossollin-Grandville, Direction Cachet, Evian (Hte-Savoie), France, Secretary General.

INTERNATIONAL GENERAL MEDICAL CONGRESS, University of Rosario Medical College, Rosario, Argentina, S. A., Nov. 7-12. Dean Jose Imhoff, Santa Fé 3100, Rosario, Argentina, S. A., Chairman.

INTERNATIONAL MEDICAL CONGRESS, Verona, Italy, Sept. 1-4. For information write: c/o Offices of the International Verona Fair, Piazza Bra., Verona, Italy.

INTERNATIONAL OFFICE OF DOCUMENTATION OF MILITARY MEDICINE, Istanbul, Turkey, Aug. 28-Sept. 1. Dr. J. Voncken, 79 rue Saint Laurent, Liege, Belgium, Secretary-General.

INTERNATIONAL SOCIETY FOR THE STUDY OF BIOLOGICAL RHYTHMS, Stockholm, Sweden, Sept. 15-17. For information write: Prof. Ture Petrén, Karolinska Institutet, Stockholm 60, Sweden.

INTERNATIONAL SYNDICATE OF GYNECOLOGISTS AND OBSTETRICIANS, Meeting Hall of Medical Societies, Paris, France, June 27-28. Dr. Jacques Courtois, 1, rue Racine, Saint-Germain-en-Laye (S & O), France, Secretary General.

INTERNATIONAL VITAMIN E CONGRESS, Cini Foundation, Island of San Giorgio Maggiore, Venice, Italy, Sept. 5-8. Prof. Emilio Raverdino, via Pietro Verri 4, Milano, Italy, Secretary.

IRISH MEDICAL ASSOCIATION, Trinity College, Dublin, Ireland, July 4-8. Dr. P. J. Delaney, 10 Fitzwilliam Place, Dublin, Ireland, Secretary.

NEURORADIOLOGIC SYMPOSIUM, London, England, Sept. 13-17. Dr. R. D. Hoare, National Hospital, Queen Square, London, W.C.1, England, Secretary.

PAN AMERICAN CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Mendoza City, Argentina, S. A., Oct. 22-26. For information address: Secretary, Caseros Av. 2154, Buenos Aires, Argentina, S. A.

PAN AMERICAN CONGRESS OF OPHTHALMOLOGY, Santiago, Chile, S. A., Jan. 9-14, 1956. Dr. Rene Contardo, Huerfanos 930, Of. 74, Santiago, Chile, Secretary General.

PAN AMERICAN CONGRESS ON RHEUMATIC DISEASES, Rio de Janeiro and Sao Paulo, Brazil, S. A., Aug. 14-20. For information write: Dr. Waldemar Bianchi, 126 Avenida Franklin D. Roosevelt, Rio de Janeiro, Brazil, S. A.

PAN AMERICAN MEDICAL SOCIAL CONVENTION, Bogota, Colombia, S. A., Oct. 15-22. Dr. Leopoldo E. Araujo, Avenida de los Presidentes Num. 506, Apartado 2589, La Habana, Cuba, Secretary.

VENEZUELAN CONGRESS OF MEDICAL SCIENCES, Caracas, Venezuela, S. A., Nov. 18-26. Dr. A. L. Briceno Rossi, Apartado 4412, Ofic. del Este, Caracas, Venezuela, S. A., Secretary General.

WORLD CONGRESS OF ANESTHESIOLOGISTS, Scheveningen, Netherlands, Sept. 5-10. For information write: Mr. W. A. Fentener van Vlissingen, Noord-Houdringelaan, 24, Bilthoven, Netherlands.

WORLD CONGRESS ON FERTILITY AND STERILITY, Naples, Italy, May 18-26, 1956. For information address: Prof. G. Tesauro, S. Andrea della Dame, 19, Naples, Italy.

WORLD CONGRESS OF JEWISH PHYSICIANS, Haifa, Tel-Aviv, Jerusalem, Israel, Aug. 10-17. Dr. Z. Avigdori, P.O.B. 1342, Jerusalem, Israel, Chairman.

WORLD CONGRESS OF PHYSICAL THERAPY, New York, New York, U. S. A., June 17-23, 1956. For information address: Miss Mildred Elson, American Physical Therapy Association, 1790 Broadway, New York 19, New York, U. S. A.

WORLD FEDERATION FOR MENTAL HEALTH, Istanbul, Turkey, Aug. 21. For information write: Miss E. M. Thornton, 19 Manchester St., London, W.1, England.

WORLD MEDICAL ASSOCIATION, Vienna, Austria, Sept. 20-26. Dr. Louis H. Bauer, 345 East 46th St., New York 17, N. Y., U. S. A., Secretary General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 21-23. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

ARIZONA:* *Examination.* Phoenix, July 13-15. *Reciprocity.* Phoenix, July 16. Sec., Dr. M. R. Richter, 2910 N. 7th Ave., Phoenix.

CALIFORNIA: *Written.* San Francisco, June 20-23; Los Angeles, Aug. 22-25; and Sacramento, Oct. 17-20. *Oral and Clinical Examinations for Foreign Medical School Graduates.* San Francisco, June 19; Los Angeles, Aug. 21; and San Francisco, Nov. 13. *Oral Examination for Reciprocity Applications.* San Francisco, June 18; Los Angeles, Aug. 20; and San Francisco, Nov. 12. Sec., Dr. Louis E. Jones, Room 536, 1020 N Street, Sacramento.

COLORADO:* *Examination.* Denver, June 14-15. Final date for filing applications was May 13. *Reciprocity.* Denver, July 12. Final date for filing application is June 13. Exec. Sec., Miss Beulah H. Hudgens, 831 Republic Bldg., Denver 2.

CONNECTICUT:* *Regular.* Hartford, July 12-14. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, July 12-13. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Examination.* Dover, July 12-14. *Endorsement.* Dover, July 21. Final date for filing applications is June 15. Sec., Dr. Joseph S. McDaniel, Dover.

FLORIDA:* *Examination.* Jacksonville, June 26-28. Sec., Dr. Homer L. Pearson, 901 N.W. 17th St., Miami.

IDAHO: *Examination and Reciprocity.* Boise, July 11-13. Ex. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

ILLINOIS: *Examination and Reciprocity.* Chicago, June 21-23. Supt. of Registration, Mr. Fredric B. Selcke, State House, Springfield.

INDIANA: *Examination.* Indianapolis, June 21-23. Exec. Sec., Miss Ruth V. Kirk, 538 K. of P. Building, Indianapolis.

IOWA:* *Examination.* Iowa City, June 13-15. Exec. Sec., Mr. Ronald V. Saf, State Office Bldg., Des Moines.

KANSAS: *Examination and Endorsement.* Kansas City, June 8-9. Sec., Dr. O. M. Davidson, 872 New Brotherhood Bldg., Kansas City.

MAINE: *Examination and Reciprocity.* Augusta, July 12-13. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular Examination.* Baltimore, June 21-24. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore 18. *Homeopathic Examination. Written.* Baltimore, June 20-22. Sec., Dr. Robert H. Reddick, Eastern Shore State Hospital, Cambridge.

MASSACHUSETTS: *Examination.* Boston, July 12-15. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston.

MINNESOTA:* *Examination.* Minneapolis, June 14-16. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: *Examination and Reciprocity.* Jackson, June 27-29. Asst. Sec., Dr. R. N. Whitfield, State Board of Health, Jackson.

MONTANA: *Examination and Reciprocity.* Helena, Oct. 4-5. Sec., Dr. Sidney A. Cooney, 7 West 6th Ave., Helena.

NEBRASKA:* *Examination.* Omaha, June. Director, Bureau of Examining Boards, Mr. Husted K. Watson, State Capitol Bldg., Room 1009, Lincoln 9.

NEVADA:* *Examination and Reciprocity.* Reno, July 5. Sec., Dr. G. H. Ross, 112 N. Curry St., Carson City.

NEW HAMPSHIRE: *Examination and Reciprocity.* Concord, Sept. 14. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW MEXICO:* *Examination and Reciprocity.* Santa Fe, Nov. 21-22. Sec., Dr. R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.

NEW YORK: *Examination.* Albany, Buffalo, Syracuse and New York City. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany 7.

NORTH CAROLINA: *Examination.* Raleigh, June 20-23. *Reciprocity.* Pinehurst, May 2, Blowing Rock, July 29. Sec., Dr. Joseph J. Combs, 716 Professional Building, Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, July 6-8. *Reciprocity.* Grand Forks, July 9. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Written.* Columbus, June 13-15. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

OREGON:* *Examination and Reciprocity.* Portland, July 7-9. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, June 27-29. Acting Sec., Mrs. Marguerite G. Steiner, Box 911, Harrisburg.

RHODE ISLAND:* *Examination.* Providence, July 7-8. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Examination.* Columbia, June 27-29. *Reciprocity.* Charleston, May 10. Sec., Mr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA:* *Examination and Reciprocity.* Rapid City, July 19-20. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

TENNESSEE: *Examination.* Nashville, June 8-9; Memphis, June 15-16. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis.

TEXAS:* *Examination and Reciprocity.* Fort Worth, June 20-22. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Reciprocity.* Salt Lake City, June 21. *Examination.* Salt Lake City, July 6-8. Director of Registration, Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City.

VERMONT: *Examination and Endorsement.* Burlington, June 15-17. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: *Examination.* Richmond, June 16-18. *Reciprocity.* Richmond, June 15. Address: The Secretary, 631 First St., S.W., Roanoke.

WASHINGTON:* *Examination and Reciprocity.* Seattle, July 10-13. Sec., Mr. Edward C. Dohm, Capitol Bldg., Olympia.

WEST VIRGINIA: *Examination and Reciprocity.* Charleston, July 11-12. Sec., Dr. N. H. Dyer, State Office Bldg., No. 5, Charleston.

WISCONSIN:* *Examination and Endorsement.* Milwaukee, July 12-14. Sec., Dr. Thomas W. Tormey, 1140 State Office Bldg., Madison 2.

ALASKA:* On application. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Sec., Dr. John E. Kennedy, Agana.

HAWAII: *Examination.* Honolulu, July 11-14. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: *Examination.* Tucson, June 21. Sec., Mr. Herbert D. Rhodes, University of Arizona, Tucson.

COLORADO: *Examination.* Denver, Sept. 14-15. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

CONNECTICUT: *Examination.* New Haven, June 11. Address: State Board of Healing Arts, 258 Bradley St., New Haven 10.

IOWA: *Examination.* Des Moines, July 12. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MICHIGAN: *Examination and Endorsement.* Detroit and Ann Arbor, Oct. 14-15. Sec., Mrs. Anne Baker, 410 W. Michigan Ave., Lansing 15.

MINNESOTA: *Examination.* Minneapolis, June 7-8. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

NEVADA: *Examination.* Reno, July 5. Sec., Dr. Donald G. Cooney, Box 9005, University Station, Reno.

NEW MEXICO: *Examination.* Santa Fe, July 17. Sec., Mrs. Marguerite Cantrell, Box 1522, Santa Fe.

OKLAHOMA: *Examination.* Oklahoma City, August 26-27. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON: *Examination.* Portland, Sept. 10 and Dec. 3. Sec., Mr. Charles D. Byrne, State Board of Higher Education, Eugene.

TENNESSEE: *Examination.* Memphis, July 6-7. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

TEXAS: *Examination.* Various cities to be determined by number of applicants from the various areas, October. Sec., Brother Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WASHINGTON: *Examination.* Seattle, July 6-7. Sec., Mr. Edward C. Dohm, Capitol Bldg., Olympia.

WISCONSIN: *Examination.* Madison, Sept. 23; Milwaukee, Dec. 3. Sec., Mr. William H. Barger, 621 Ransom St., Ripon.

ALASKA: On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

*Basic Science Certificate required.

MAGAZINE–TELEVISION REPORT

The following list of current medical articles in mass-circulation magazines and forthcoming network television programs on medical subjects is published each week only for the information of readers of THE JOURNAL. *Unless specifically stated, the American Medical Association neither approves nor disapproves of the articles and programs reported.*

TELEVISION

Monday, June 20

NBC-TV, 9 p. m. EDT. "Medic" repeats its program on hemophilia, "A Time to Be Alive."

MAGAZINES

Town Journal, June, 1955

"The TRUTH About Polio Shots," by Howard LaFay

An interview with Dr. Hart E. Van Riper, medical director of the National Foundation for Infantile Paralysis, in which he answers questions about poliomyelitis that "torment American parents."

Pageant, July, 1955

"Hepatitis," by Henry Lee

Hepatitis has "jumped to fifth place on the U. S. Health Department's listing of communicable diseases and has become a major medical problem." The author describes symptoms and theories, pointing out that science still knows little about this disease.

Good Housekeeping, July, 1955

"Itching," by Maxine Davis

The magazine's medical editor discusses the symptoms of itching. It can mean, she says, "any one of a number of different conditions, from dandruff to diabetes; from skin irritation caused by cold weather, an antibiotic drug, or something one eats, to just old age." She warns: "Only a doctor can evaluate the condition and not only take measures to relieve the itching, and thereby halt scratching, but also find out the cause of the itching and cure that too."

Look, June 28, 1955

"New Hope for the Deaf," by William Chapman White

A description of an operative procedure called "mobilization of the stapes" devised by Dr. Samuel Rosen, Mount Sinai Hospital, New York. The article also takes up other ear surgery and discusses relative merits of Dr. Julius Lempert's fenestration operation.

DEATHS

Carpenter, Robert John ✠ North Adams, Mass.; born in Mechanics Falls, Maine, March 5, 1888; Tufts College Medical School, Boston, 1914; three times in his career put aside his medical practice to serve as an army surgeon; saw duty with the Punitive expedition at the Mexican border, in World War I was commander of a field hospital in France, later serving with the Army of Occupation in Germany, and during World War II went to Washington, D. C., as executive officer to the Surgeon General of the Army, winning the Legion of Honor medal for his outstanding performance of the duties of that office; chairman of the board of health of North Adams from 1921 to 1924, associate member of the municipal board of appeals from 1927 to 1936, and member of the board of library trustees, 1940 to 1941; past-president of the Berkshire District Medical Society, Northern Berkshire Medical Society, and the Berkshire District Tuberculosis Association; director of the Massachusetts State Tuberculosis Association; chairman of the Blue Shield District Professional Service Committee and president of the North Adams Branch of the American Red Cross; since 1952 director of the North Adams Hospital, where he was president of the hospital staff; died May 9, aged 67, of coronary disease.

Stewart, George Adolph ✠ Baltimore; born in Philadelphia Feb. 28, 1885; Johns Hopkins University School of Medicine, Baltimore, 1911; assistant professor emeritus of surgery at his alma mater; member of the founders group of the American Board of Surgery; member of the American Association for Thoracic Surgery; fellow of the American College of Surgeons; past-president of the American Association for the Study of Neoplastic Diseases; veteran of World War I and was decorated by the French government; served in World War II; on the staffs of the Johns Hopkins, St. Agnes, and Bon Secours hospitals; consultant at the Veterans Administration Hospital; died in Johns Hopkins Hospital April 23, aged 70, of coronary thrombosis.

Whitehead, William Doles ✠ Scranton, Pa.; University of Tennessee College of Medicine, Memphis, 1921; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; served during World War I; formerly county health officer; chairman of board of censors and past-president of the Lackawanna County Medical Society; consultant, Veterans Administration Hospital, Wilkes-Barre; associated with the Hahnemann Hospital and Scranton State Hospital; died in the Moses Taylor Hospital April 25, aged 58, of rupture of the right internal iliac artery.

Pascal, Joseph Irving ✠ New York City; Medizinische Fakultät der Universität, Vienna, Austria, 1931; associate ophthalmologist and lecturer in ophthalmology New York Polyclinic Medical School and Hospital; lecturer on ophthalmology, Brooklyn Eye and Ear Hospital; adjunct in ophthalmology, Montefiore Hospital; director of eye department, Stuyvesant Polyclinic; associated with the Hospital for Joint Diseases, Beth David Hospital, and Harlem Eye and Ear Hospital; author of "Studies in Visual Optics"; died in the Manhattan General Hospital April 22, aged 65, of congestive heart disease.

Gray, John Edward ✠ Sacramento, Calif.; State University of Iowa College of Medicine, Iowa City, 1926; specialist certified by the American Board of Ophthalmology; member of the Association for Research in Ophthalmology and the Pacific Coast Oto-Ophthalmological Society; on the advisory staff of the National Society for the Prevention of Blindness and the American Orthoptic Council; senior visiting surgeon in ophthalmology at the Sacramento Hospital; staff member of the Sutter and Mercy hospitals; died April 14, aged 43, of pulmonary edema due to mitral stenosis.

✠ Indicates Member of the American Medical Association.

Langdon, John ✠ Providence, R. I.; Harvard Medical School, Boston, 1928; certified by the National Board of Medical Examiners; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics and the New England Pediatric Society; on the staff of the Emma Pendleton Bradley Home in East Providence, the Memorial Hospital in Pawtucket, the Charles V. Chapin Hospital, and the Rhode Island Hospital, where he died April 20, aged 52, of hypertensive cardiovascular disease, general arteriosclerosis, and myocardial infarction.

Abbe, Truman ✠ College Park, Md.; Columbia University College of Physicians and Surgeons, New York City, 1899; in 1907 awarded Silver medal for demonstration of application of radium to medicine at the Jamestown Exposition; served on the staffs of the George Washington University Hospital and the Columbia Hospital for Women in Washington, D. C.; member of the Medical Society of the District of Columbia; died in the Central Dispensary and Emergency Hospital, Washington, D. C., May 2, aged 81, of coronary thrombosis.

Abbott, Solon, Franklin, Mass.; the Hahnemann Medical College and Hospital, Chicago, 1882; died April 15, aged 98, of virus pneumonia.

Alexander, George Harold ✠ Providence, R. I.; Yale University School of Medicine, New Haven, Conn., 1931; certified by the National Board of Medical Examiners; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychoanalytic Association and the American Psychiatric Association; on the staff of the Butler Hospital; died April 28, aged 53, of coronary thrombosis.

Allison, John Starr ✠ Tahlequah, Okla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1895; formerly associated with the Indian Service; for many years college physician for the Northeastern State College; died April 27, aged 88, of coronary occlusion.

Aquilino, Joseph Frank, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1924; died April 21, aged 54.

Armstrong, Fred Francis ✠ Wilmington, Del.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1917; served during World War I; formerly medical examiner for the city public schools; secretary of the city board of health for 12 years, from 1923 to 1935; in recent years a medical examiner for railroads and medical director of the Life Insurance Company of America; on the staff of Wilmington General Hospital, where he died May 3, aged 62, of coronary occlusion.

Arnett, Arett Campbell ✠ LaFayette, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1907; fellow of the American College of Surgeons; in 1917 served on the Mexican border with the National Guard; during World War I was a major in the Army Medical Corps, serving with the Rainbow division; co-founder of the Arnett Clinic; first president of the Chamber of Commerce; on the staff of St. Elizabeth Hospital; consultant, LaFayette Home Hospital; died April 2, aged 72, of acute coronary occlusion.

Barker, Ephriam Richard ✠ Healdton, Okla.; Eclectic Medical University, Kansas City, Mo., 1906; Kansas City College of Medicine and Surgery, 1920; at one time vice-president of the Carter County Medical Association; served as clerk on the first school board, city treasurer, and long time city health officer; died April 23, aged 78, of myocardial failure.

Barothy, Arpad M. ✠ Chicago; Rush Medical College, Chicago, 1894; died April 29, aged 85, of cerebral hemorrhage.

Bauer, John Nathan, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1896; died April 11, aged 82, of cardiovascular arteriosclerosis.

V 15
1955

Beir, Ily Rosenberg ✦ Atlantic City, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; on the staff of the Atlantic City Hospital; died April 10, aged 75, of cerebral hemorrhage.

Beise, Rudolph Arthur ✦ Brainerd, Minn.; Rush Medical College, Chicago, 1901; member of the American Academy of General Practice; served as county health officer, mayor, and on the city park board; a charter member of the Rotary Club and in 1923-1924 served as its president; one of the founders of the First Federal Savings and Loan Company; member of the staff of St. Joseph's Hospital, where he died April 9, aged 78, of coronary thrombosis.

Bennett, Newman Hall ✦ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1906; fellow of the American College of Surgeons; member of the American Association of Railway Surgeons; on the staff of St. Joseph's Hospital; died April 17, aged 82, of coronary thrombosis.

Bennie, James Walker ✦ Clearwater, Neb.; Detroit College of Medicine, 1910; chairman of the board of education; president of the Clearwater State Bank; died in Orchard April 2, aged 72, of coronary thrombosis.

Beschloss, Ottokar, Taylorville, Ill.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1923; died in the Lincolnview Hospital, Springfield, April 30, aged 55, of coronary occlusion.

Bledsoe, Claude, Gloversville, N. Y.; Albany Medical College, 1910; fellow of the American College of Surgeons; on the honorary staff, Nathan Littauer Hospital, where he died April 21, aged 69, of congestive heart failure.

Blodgett, John Moody ✦ Lancaster, N. H.; University of Maryland School of Medicine, Baltimore, 1910; died March 24, aged 74, of cerebral hemorrhage.

Bridgeman, Richard B. Jr., Oregon, Mo.; University of Louisville (Ky.) School of Medicine, 1927; member of the American Psychiatric Association; died March 18, aged 54, of carcinoma of the liver.

Bronson, William Thaddeus ✦ Danbury, Conn.; New York University Medical College, New York City, 1898; on the staff of Danbury Hospital; died April 26, aged 85, of carcinoma of the prostate.

Brown, Radford ✦ Washington, D. C.; George Washington University School of Medicine, Washington, 1923; clinical professor of obstetrics and gynecology at his alma mater; specialist certified by the American Board of Obstetrics and Gynecology; served in the U. S. Navy; on the staffs of the District of Columbia General Hospital, Garfield Memorial Hospital, and the George Washington University Hospital, where he died April 23, aged 55, of rupture of the interventricular septum.

Burdashaw, James Frederick ✦ Augusta, Ga.; University of Georgia Medical Department, Augusta, 1911; an associate member of the American Medical Association; died in the University Hospital March 24, aged 79, of uremia.

Burger, Julius Anthony ✦ Shawnee, Kan.; St. Louis University School of Medicine, 1919; on the staffs of the Bethany and Providence hospitals in Kansas City; chief anesthetist at St. Margaret's Hospital, Kansas City, where he died May 3, aged 64, of collagen disease of the intestinal tract.

Caffrey, John Joseph ✦ Wilkes-Barre, Pa.; Medico-Chirurgical College of Philadelphia, 1916; served during World War I; on the staffs of the Nanticoke (Pa.) State Hospital and the Mercy Hospital, where he died April 23, aged 63, of myocardial infarction.

Campbell, Frederick Leon ✦ Boston; Tufts College Medical School, Boston, 1933; president-elect and one of the organizers of the Massachusetts Academy of General Practice; served during World War II; on the staff of St. Elizabeth Hospital; trustee of the Brighton Five Cents Savings Bank; died April 11, aged 49, of coronary thrombosis.

Cantor, Jacob August, New York City; Cornell University Medical College, New York City, 1918; formerly associated with the Home for Hebrew Infants and the Lebanon Hospital, where he died April 23, aged 59, of heart disease.

Casto, Parley Carper ✦ St. Joseph, Ill.; Baltimore Medical College, 1900; died May 13, aged 81, of cerebrovascular accident and chronic hypertensive arteriosclerosis.

Cazier, Lawrence Wallace ✦ Wamego, Kan.; University of Kansas School of Medicine, Kansas City, Kan., 1920; past-president of the Pottawatomie County Medical Association; served during World War I; city and county health officer; on the staff of Genn Hospital; died April 10, aged 64.

Center, Ervin Alfred, Steeple Falls, Maine; McGill University Faculty of Medicine, Montreal, Canada, 1923; formerly a legislator; health officer of the town of Standish; on the staffs of the Mercy Hospital, Maine Eye and Ear Infirmary, and the Maine Medical Center, all of Portland; died April 23, aged 56, of myocardial infarction.

Chisholm, Donald Raymond ✦ Los Gatos, Calif.; Dalhousie University Faculty of Medicine, Halifax, N. S., Canada, 1927; member of the American College of Chest Physicians and the Hawaii Territorial Association; an associate member of the American Medical Association; died April 18, aged 50.

Cline, Daniel Edward, Pensacola, Fla.; St. Louis College of Physicians and Surgeons, 1923; died in the Baptist Hospital March 6, aged 71, of acute myocardial infarction.

Cole, Arthur Judson ✦ Holbrook, Mass.; University of Maryland School of Medicine, Baltimore, 1909; died March 9, aged 82, of diabetes mellitus and pneumonia.

Cole, Chester W., Brooklyn, N. Y.; University and Bellevue Hospital Medical College, New York City, 1907; affiliated with Adelphi and Midwood hospitals; died in Brooklyn Hospital April 26, aged 71, of bronchopneumonia.

Cottrell, Thomas ✦ Chicago; Illinois Medical College, Chicago, 1906; clinical assistant professor of urology (Rush) University of Illinois College of Medicine; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; on the staff of the Henrotin Hospital; died in Wauwatosa, Wis., May 3, aged 71, of pulmonary embolism.

Cross, Sumner H. ✦ Jenkintown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; fellow of the American College of Physicians; physician in chief at the Abington Memorial Hospital in Abington, where he died April 23, aged 77.

Cushing, Arthur Alden ✦ Brookline, Mass.; Harvard Medical School, Boston, 1904; on the advisory council of the public health department; served during World War I; medical officer on the Brookline Selective Service Board from 1940 to 1945, and since 1949 medical adviser; on the staffs of the Faulkner and New England Deaconess hospitals in Boston; died April 21, aged 74, of coronary thrombosis.

Davies, Raymond Evan ✦ Spring Valley, Ill.; Rush Medical College, Chicago, 1917; past-president of the Bureau County Medical Society, of which he had been secretary for many years; served during World Wars I and II; president-elect of the Spring Valley Rotary Club; died in the Baptist Hospital, Alexandria, La., April 18, aged 65, of coronary thrombosis.

Dawson, Julian, Chicago; Northwestern University Medical School, Chicago, 1914; served during World War I; for many years on the staff of the Provident Hospital, where he was senior surgeon; died May 5, aged 67, of hypertensive heart disease.

Deal, Daniel Lawrence, Statesboro, Ga.; University of Georgia Medical Department, Augusta, 1908; died in the Veterans Administration Hospital in Dublin April 9, aged 75, of congestive heart failure and generalized arteriosclerosis.

Dent, John Harris Jr., Chicago; Chicago Medical School, 1928; died April 25, aged 56.

De Pew, Evarts Vaine ✦ San Antonio, Texas; Rush Medical College, Chicago, 1904; served during World War I; fellow of the American College of Physicians; past-president, secretary, and treasurer of the Bexar County Medical Society; at one time secretary of the Fifth District Medical Society; for years member of the city board of health; died in the Brooke Army Hospital Feb. 7, aged 79, of arteriolar nephrosclerosis.

De Pew, Frank L. ✦ Colorado Springs, Colo.; Keokuk (Iowa) Medical College, 1898; for many years practiced in Howard, Kan.; served during World War I; died April 24, aged 77, of coronary arteriosclerosis.

Donahue, Matthew Edward ✦ Washington, D. C.; Georgetown University School of Medicine, Washington, 1920; had been formerly associate professor of clinical surgery at his alma mater; served a short time in the Navy during World War I; on the executive staff of Georgetown University Hospital; died May 1, aged 59, of circulatory failure, multiple myocardial infarction, and bronchopneumonia.

Dowling, Fred V., Waltham, Mass.; Middlesex University School of Medicine, Waltham, 1928; member of the New England Society of Psychiatry; veteran of World War I; senior physician at the Fernald State School; died April 29, aged 57, of coronary disease.

Doyle, Annie Gertrude Greany, North Dighton, Mass.; Woman's Medical College of Baltimore, 1901; served on the staff of the Fall River City (Mass.) Hospital, now known as the Fall River General Hospital; died April 27, aged 75, of general arteriosclerosis and cerebral thrombosis.

Drummond, Joseph Blake, South Portland, Maine; Medical School of Maine, Portland, 1910; at one time on the faculty of his alma mater; member of the founders group of the American Board of Surgery; member of the New England Surgical Society; fellow of the American College of Surgeons; served on the staff of the Maine General Hospital in Portland, where he died April 21, aged 70, of aortic aneurysm.

Dummit, Manford, Long Beach, Calif.; University of Louisville (Ky.) Medical Department, 1909; died April 21, aged 69.

Dunston, Edwin Leslie ✦ Chicago; Medizinische Fakultät der Universität, Vienna, Austria, 1923; on the staff of the American Hospital, where he died April 15, aged 59, of multiple myeloma.

Ellis, Ruth Elizabeth, Pittsburg, Calif.; University of Arkansas School of Medicine, Little Rock, 1948; served during World War II; died May 6, aged 35.

Epstein, Sidney ✦ Brooklyn, N. Y.; Long Island College Hospital, Brooklyn, 1928; on the staff of the Jewish Hospital; died in Miami, Fla., May 4, aged 49, of coronary disease.

Ferguson, James Cory ✦ St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; member of the American Academy of General Practice; on the staffs of St. Joseph's, St. John's, and St. Luke's hospitals; died April 17, aged 79, of ruptured aneurysm of the splenic artery.

Finney, Clarence Eddie McClenahan ✦ Springfield, Ohio; Rush Medical College, Chicago, 1919; fellow of the American College of Surgeons; past-president of the Clark County Medical Society; interned at the Presbyterian Hospital in Chicago and the Ohio Valley General Hospital in Wheeling, W. Va.; on the honorary and consulting staff of Springfield City Hospital; on the consulting staff of Mercy Hospital; died April 9, aged 65, of acute coronary thrombosis.

Gecht, Max, Ocean Park, Calif.; Loyola University School of Medicine, Chicago, 1918; died in Santa Monica (Calif.) Hospital April 28, aged 68, of general arteriosclerosis and coronary occlusion.

Gerdine, Linton ✦ Athens, Ga.; Johns Hopkins University School of Medicine, Baltimore, 1913; specialist certified by the American Board of Pediatrics; served during World Wars I and II; died in St. Mary's Hospital March 3, aged 65, of acute coronary occlusion.

Gillespie, Thaddeus Reamy ✦ Cincinnati; University of Cincinnati College of Medicine, 1923; interned at Jefferson Hospital in Roanoke, Va.; assistant professor of obstetrics at his alma mater; a staff member of the Bethesda Hospital; died April 21, aged 60, of cancer.

Glassman, Isaac, New York City; University and Bellevue Hospital Medical College, New York City, 1914; on the staff of the Beth David Hospital; died May 4, aged 64.

Goldfine, Manuel ✦ Chicago; University of Illinois College of Medicine, Chicago, 1936; served during World War II; died in the Mercy Hospital May 7, aged 47, of acute posterior myocardial infarction and arteriosclerotic heart disease.

Gracely, William N., Cincinnati; Pulte Medical College, Homeopathic, Cincinnati, 1903; on the staff of St. Mary's Hospital, where he died April 23, aged 75, of cardiovascular disease.

Grant, John Henry Jr. ✦ Evansville, Ind.; Indiana University School of Medicine, Indianapolis, 1947; interned at St. Margaret Hospital in Hammond; following two years of military service, served a residency in psychiatry at the Logansport (Ind.) State Hospital; on the staffs of the Evansville State Hospital and the Protestant Deaconess Hospital, where he died April 16, aged 31, of myocardial infarction.

Gray, John Randolph ✦ San Jose, Calif.; Lincoln (Neb.) Medical College of Cotner University, 1902; past-president of the Idaho State Medical Association; an associate member of the American Medical Association; died in San Jose April 22, aged 82, of hypostatic pneumonia, hypertensive heart disease, and diabetes mellitus.

Green, Nathan Williams ✦ New Canaan, Conn.; Columbia University College of Physicians and Surgeons, New York City, 1898; an associate member of the American Medical Association; fellow of the American College of Surgeons; formerly practiced in New York City; died in Norwalk (Conn.) Hospital April 21, aged 84.

Hammond, Harry Joseph ✦ Buffalo; University of Cincinnati College of Medicine, 1913; an associate member of the American Medical Association; veteran of World War I; served on the staffs of Mercy Hospital in Buffalo, and Our Lady of Victory Hospital in Lackawanna; died April 9, aged 67, of hypostatic pneumonia.

Harris, Charles L., Melbourne, Ark. (licensed in Arkansas in 1903); died April 19, aged 73.

Harrison, Uen Samuel ✦ Neligh, Neb.; St. Louis University School of Medicine, 1913; past-president of the Elkhorn Valley Medical Association and the Six County Medical Society; served during World War I; chief of Antelope Memorial Hospital, where he died April 6, aged 64, of coronary thrombosis.

Hart, Hugh McCullough ✦ New Wilmington, Pa.; University of Pittsburgh School of Medicine, 1923; interned at St. Francis Hospital in Pittsburgh; affiliated with the Jameson Memorial Hospital, New Castle, where he died April 15, aged 57, of coronary thrombosis.

Hines, Laurence Edward ✦ Chicago; Northwestern University Medical School, Chicago, 1920; professor of medicine at his alma mater; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served during World War I; on the staffs of the Passavant Memorial Hospital and St. Joseph Hospital, where he died May 13, aged 58, of cerebral thrombosis and arteriosclerosis.

Hinkle, George W. ✦ Denton, Texas; University of Texas School of Medicine, Galveston, 1934; past-president of the Denton County Medical Society; interned at the City of Detroit Receiving Hospital; served a residency at the Methodist Hospital in Fort Worth, Texas; died April 20, aged 50, of coronary occlusion.

Hopkins, Robert L., Maitland, Fla.; University of Nashville (Tenn.) Medical Department, 1906; died in the Ochsner Foundation Hospital, New Orleans, April 30, aged 74, of myasthenia gravis.

Irvin, Edgar Harland, El Paso, Texas; Jefferson Medical College of Philadelphia, 1899; past-president of the El Paso County Medical Society; past-president of the school board; served during World War I; on the staff of the Hotel Dieu, Sisters' Hospital; died in the Southwestern General Hospital April 17, aged 80, of heart disease.

Johnson, Henry Lee, Woodward, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1917; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; formerly superintendent of Western State Hospital in Fort Supply; died in Oklahoma City April 23, aged 70, of cerebral arteriosclerosis and pulmonary embolism.

Kahlo, Harry Colby, Indianapolis; Medical College of Indiana, Indianapolis, 1892; died March 25, aged 85, of congestive heart failure and arteriosclerotic heart disease.

Kelly, Obie R. ✦ Sheridan, Ark.; University of Louisville (Ky.) Medical Department, 1909; member of the Sheridan school board since 1916, serving as president of the board for 27 years; president of the Grant County Medical Society; died April 21, aged 69, of coronary occlusion.

King, Walter Wellman ✦ Peoria, Ill.; Northwestern University Medical School, Chicago, 1930; specialist certified by the American Board of Orthopaedic Surgery; member of the Clinical Orthopaedic Society and the American Academy of Orthopaedic Surgeons; served during World War II and was awarded the Bronze Star medal; on the staff of the Methodist Hospital, where he died April 13, aged 53, of infarction of the myocardium due to arteriosclerotic coronary thrombosis.

Klatman, Samuel ✦ Youngstown, Ohio; Ohio State University College of Medicine, Columbus, 1929; spent almost four years aboard a transport ship that carried wounded and sick servicemen between the Aleutians and the United States; for many years on the staff of the South Unit of the Youngstown Hospital, where he interned; member of the courtesy staff of St. Elizabeth's Hospital; assistant medical director for the Youngstown Hospital Association; died April 28, aged 49, of coronary occlusion.

Klocker, Karl James ✦ Silver Lake, Wis.; Rush Medical College, Chicago, 1935; served during World War II; on the staffs of the Mercy Hospital in Chicago and the Burlington (Wis.) Memorial Hospital; died April 29, aged 48, when the tractor that he was on tipped over and crushed him.

Lanphere, Grant Harold ✦ Los Angeles; Rush Medical College, Chicago, 1920; assistant professor of medicine at the College of Medical Evangelists, Loma Linda and Los Angeles; member of the Industrial Medical Association and the Southern California Gastroenterology Society, which he served as president; consulting physician at the French Hospital and the California Hospital, where he died April 26, aged 69, of infarction of the myocardium and arteriosclerosis.

Levine, Isidor ✦ Brooklyn, N. Y.; Long Island College Hospital, Brooklyn, 1910; died April 29, aged 72.

Lewis, Powell K. ✦ Sapulpa, Okla.; University of the South Medical Department, Sewanee, Tenn., 1901; physician for the Frisco Railroad; past-president of the Sapulpa Rotary Club; on the staffs of the Sapulpa City Hospital and the Curry Hospital and Clinic, where he died April 29, aged 75, of coronary occlusion.

Lockwood, Frederick William ✦ Fort Morgan, Colo.; Gross Medical College, Denver, 1898; an associate member of the American Medical Association; formerly mayor and councilman; for many years a member of the board of regents of the University of Colorado in Boulder; on the staff of the Community Hospital; died April 6, aged 79, of coronary occlusion.

Lyon, Charles Walter ✦ Ellinwood, Kan.; Marion-Sims-Beaumont Medical College, St. Louis, 1897; died in Ellinwood District Hospital March 3, aged 79, of arteriosclerosis.

McCracken, Paul Wilson ✦ Newark, Ohio; George Washington University School of Medicine, Washington, D. C., 1939; interned at the Minneapolis General Hospital; fellow of the American Public Health Association; for many years practiced in Phoenix, Ariz., where he was director of health in Maricopa County; died April 24, aged 41.

McKenzie, William, Philadelphia; Dunham Medical College, Chicago, 1902; died in the Hahnemann Hospital April 24, aged 76.

McMahon, Francis C. ✦ Stamford, Conn.; Fordham University School of Medicine, New York City, 1919; past-president of the Stamford Medical Society; served during World War I; since 1952 medical examiner; formerly chairman of the board of public safety; past-president of the Lions Club; on the staffs of the Stamford Hospital and St. Joseph Hospital, where he died May 9, aged 59, of malignant hypertension and cerebral vascular accident.

Matthei, Edward, Jersey City, N. J.; Baltimore Medical College, 1896; for many years on the staff of the Christ Hospital; died in the East Orange (N. J.) General Hospital April 11, aged 86, of annular carcinoma of the ileocecal junction and peritonitis.

Means, Robert Ross ✦ Livingston, Mont.; Washington University School of Medicine, St. Louis, 1928; city and county health officer; formerly division surgeon for the Missouri Pacific Railway at Osawatomie, Kan.; died April 2, aged 53, of coronary thrombosis.

Merritt, Frank Denton, Auburn, Wash.; Columbia University College of Physicians and Surgeons, New York City, 1893; served four terms as city councilman, and two terms on the school board; died in Auburn General Hospital April 12, aged 85, of cerebral hemorrhage.

Miller, Charles William, Fairborn, Ohio; Starling Medical College, Columbus, 1888; past-president of the Greene County Medical Society; died in the McClellan Hospital, Xenia, April 20, aged 93, of cerebral hemorrhage.

Miller, Linus John ✦ Atlanta, Ga.; University of Pittsburgh School of Medicine, 1936; member of the American Society of Anesthesiologists, Inc.; served during World War II; on the staff of the Crawford W. Long Memorial Hospital; died April 8, aged 44, of coronary occlusion due to myocardial infarction.

Moore, William B. ✦ Cynthiana, Ky.; University of Louisville (Ky.) Medical Department, 1894; past-president of the Harrison County Medical Society, of which he was secretary for many years; an associate member of the American Medical Association; member of the board of directors of the Harrison Memorial Hospital, where he died April 25, aged 86, of cerebral hemorrhage.

Nesbitt, Eli Paulus, Sheridan, Mo.; Central Medical College of St. Joseph, Mo., 1897; died in Tulsa, Okla., April 23, aged 81, of cancer.

Olsen, Walter Julius, Escanaba, Mich.; Marquette University School of Medicine, Milwaukee, 1938; died in St. Francis Hospital April 2, aged 47, of hemorrhage from esophageal varices.

Rabinovitch, Alec, Colchester, Conn.; University of Vermont College of Medicine, Burlington, 1919; member of the Connecticut State Medical Society; served during World War I; died April 14, aged 58.

Reckers, William Augustus ✦ Carmel, Calif.; Cooper Medical College, San Francisco, 1901; an associate member of the American Medical Association; served during World War I; part-owner and medical director of the Placerville (Calif.) Sanatorium, where he died April 10, aged 79, of cancer and pancreatitis.

Rudell, William Patrick, Davis, Okla.; College of Physicians and Surgeons, Little Rock, 1911; served during World War I; formerly on the staff of the Veterans Administration Hospital in Sulphur; died April 2, aged 68, of coronary occlusion.

West, Byron Stevens ✦ Syracuse, N. Y.; Syracuse University College of Medicine, 1926; also a dentist; clinical assistant professor of surgery at his alma mater; past-president of the Onondaga County Medical Society; member of the American Society of Maxillofacial Surgeons and the American Association for Cleft Palate Rehabilitation; served during World War II; on the staff of Crouse-Irving, General, University, and Syracuse Memorial hospitals; assistant editor of *The Bulletin;* died in Dewitt Feb. 9, aged 52.

Willard, Lawrence Edward, Saco, Maine; Baltimore Medical College, 1898; for many years health officer; on the staff of the Webber Hospital in Biddeford, where he died April 25, aged 80, of carcinoma of the esophagus.

Wise, William ✦ Indianapolis; Indiana University School of Medicine, Indianapolis, 1916; past-president of the Indiana State Board of Health; physician for the city public schools for 25 years; during his practice was on the staffs of the Methodist, St. Vincent's, and Indianapolis General hospitals; died April 18, aged 65, of cerebral thrombosis.

FOREIGN LETTERS

ARGENTINE

Award to Professor Leriche.—The official Confederación de Profesionales has established a "Prize America—Juan D. Peron" to be awarded every second year to the person who has done the most to benefit mankind. The first recipient of this prize, amounting to about $71,500, is Prof. René Leriche, a French surgeon who has delivered many lectures in Argentina. He was professor of the medical schools of Lyon, Strasbourg, and the College de France of Paris. He is now retired and could not attend the ceremony at Buenos Aires due to poor health, so the award was accepted on his behalf by Prof. Henri Bénard, secretary of the Academy of Medicine of Paris, at a formal ceremony on April 14, Day of the Americas.

BELGIUM

Ultraviolet Rays and Cancer.—At the Royal Academy of Medicine van der Schueren and Bonté reported on the influence of ultraviolet rays on the appearance of cancerous lesions. They pointed out that these rays can produce ulcerative epitheliomas of the ear in white mice after a latent period of four months. The percentage of tumors is 14.6. Metastases are never observed. A massive dose of ultraviolet irradiation is required for the production of these tumors. A large proportion of albino mice are killed in experiments with long, repeated sessions of ultraviolet irradiation. Frogs were used in another series of experiments. A single total irradiation with ultraviolet rays lasting 15 minutes on the average and corresponding to 31,920 microwatts per square centimeter systematically kills all frogs of the species Rana temporaria. In contrast, all animals of the Rana esculenta species are immune to this procedure. A double dose of this irradiation administered all at once to 5-day-old mice or epilated adult mice killed none of them. The lethal effect of ultraviolet rays on brown frogs can be mitigated either by injection of sodium cyanide before irradiation, by refrigeration during irradiation, or by exposure to daylight (300 lux) and placing of the frogs in running water after irradiation. The irradiated brown frogs discharge large amounts of sodium. Feeding them sodium decreases their mortality rate. With certain reservations, Rana temporaria and the white mouse act exactly opposite in regard to ultraviolet rays and hard x-rays. The brown frogs can survive doses of x-rays that kill 100% of the white mice. On the other hand, albino mice seem to be perfectly well after an exposure to ultraviolet irradiation that kills all the brown frogs.

Salmonelloses in the Congo.—Working in the medical laboratory at Astrida, Ruanda-Urundi, Fain systematically isolated Salmonella organisms in domestic and wild animals in the Ituri and Ruanda-Urundi regions of the Belgian Congo during a two and one-half year period. Salmonella organisms were also isolated from human beings during routine examinations (*Annales belges de médecine tropicale*). Thirty-five serologic types of Salmonella were found. Six types were found exclusively in man; 5 in man and animals; one in man, animals, and lake water; 21 in different animals only; and 2 types only in lake water. Seven were new types, and 11 were types that had not previously been found in the Congo. More than 1,000 animals were examined; 85 of them were Salmonella carriers. Of all the domestic animals examined, the duck is the greatest germ carrier and is the most dangerous for man. Of the 347 domestic ducks examined, 41 (11.8%) had Salmonella organisms in the intestine. These were of 19 serologic types, among which were a number of types pathogenic to man, such as S. typhimurium, S. irumu, and S. stanleyville. Crows, which are plentiful in the Congo, are probably another important reservoir of types of Salmonellae pathogenic to man. Twenty-five crows were examined by coproculture in Blukwa and Ruanda-Urundi. Four types of Salmonella were found, including S. dublin and S. paratyphi B var. jawa. Other animals, both wild and domestic, namely, hen, eagle, civet, serval, snake, lizard, chameleon, and leech, can harbor pathogenic types of Salmonella in the intestine. Three serologic types of Salmonella were isolated from the Tanganyika and Mohasi lakes. The author believes that migratory aquatic birds may play a part in the dissemination of Salmonella organisms at great distances. The role played by bovine animals in epidemics caused by S. dublin was shown bacteriologically in the Belgian Congo through the simultaneous isolation of this germ from the patients' stools and the meat they had eaten.

Psychoses After Hysterectomy.—At the November meeting of the Psychiatric Society of Belgium, Cordier stated that psychosis occurs fairly frequently after hysterectomy. The speaker had seen three such cases within several months. A 40-year-old woman, seven days after an operation for fibroma, without anomaly, became hypomanic and had delusions of persecution, false remembrances, excitation, loquacity, association by assonance, and unmotivated rages. Insulin shock therapy without deep coma improved the patient's condition, but persecution delirium and mystic interpretation persisted. A cure was achieved after two months. Another patient, aged 43 years, with a hypomanic syndrome after hysterectomy for fibroma was cured by insulin therapy without deep coma. The third patient, who also had a fibroma, displayed bizarre behavior a month after operation, with suspicion, political delusions, hallucinations, and disorientation. She was given insulin shock therapy. Later she had an epileptic attack with paraplegia and retention of urine. She was completely cured. There is no plausible explanation of the cause of these psychoses. The patients' particular psychic makeup appears to play an important part. This type of psychosis can be compared to the types appearing during the puerperium and the menopause. An acute endocrinopathy appears to be superimposed on a special psychic background. The factor of affective shocks must also be kept in mind. Insulin therapy without coma gives good results.

ENGLAND

The Newer Nursing.—Controlled experiments to test the value of new methods of nursing and nurse training are recommended in a report by the Standing Nursing and Midwifery Advisory Committee of the Scottish Health Services Council. To assess the value of the "patient assignment" system, the committee envisages a one-year trial in a ward of 36 patients in a general training hospital, during which the aim would be to concentrate a small number of nurses on a small group of patients instead of asking nurses to perform single duties for relatively large groups of patients. The nurse's attention would thus be directed to the whole person and she would come to know her patients better than is possible now. The patient should benefit greatly from such a system. This would be a more costly method of nurse staffing than the present one, and it is suggested that the additional money needed should be taken from research or endowment funds. Until experiments have been conducted, it cannot be said that there may not be compensating advantages. Experiment may show how far it is possible to improve patient care, to promote greater nursing efficiency, to quicken the interest of the work done by staff and student nurses, and to weld the assistant nurse and the nursing auxiliary into the team of nurses working in the wards of general teaching hospitals.

Two experiments to discover ways in which nurse training might be made more interesting and effective are suggested: an

The items in these letters are contributed by regular correspondents in the various foreign countries.

V 15
1955

experiment in which nurses would be trained under special conditions for the General Register in two years (instead of three as at present), and an experiment in which nurses would receive a course of training of much wider content than the present training in three years. The governing principle of the former would be that the student nurse should only be given as much experience in routine tasks as is necessary to teach her to do these tasks efficiently and with understanding. To help her to get the maximum benefit from the experience, nurse tutors would be made responsible for teaching student nurses while they are working in the ward under the general direction of the ward nurse. These tutors would explain to the student nurse not only what she had to do but why she had to do it. The aim throughout would be to present to the nurse a picture of the work of the hospital and to bring home to her the importance of being a member of the hospital team. The experiment would be based on the patient assignment system, which would give the nurse greater opportunity to know her patients as individuals and would make her work more interesting. The students would be given state registration at the end of the two-year period of training if they passed the necessary examinations. Such shortened training might be particularly important because of the possibility of attracting recruits to nursing from the universities.

The committee also appealed for a review of the burden of work placed on ward nurses by inventories, records, and clerical work to see whether this could be reduced, so that the ward nurse could devote more time to caring for her patients. The enrolled assistant nurse must become increasingly an integral part of the nursing team. It is hoped that one of the large general training hospitals in Scotland will now be prepared to lead the way in raising the status of the assistant nurse grade by establishing assistant nurse training in a hospital that is already providing training for the General Register. The committee believes that the time may have come for the nursing and medical professions to consult with each other on a redefinition of the boundaries of a nurse's duty. In the committee's view a nurse should be required neither to undertake procedures such as the intravenous administration of fluids or the taking of blood pressures nor, at the other extreme, to do routine domestic work in the ward. Within these limits, however, there are many jobs that the student nurse must learn to do herself in order better to supervise others when she reaches a position of responsibility.

Medical Art and History.—An exhibit has been organized by the Devon and Exeter Medico-Chirurgical Society and the Exeter Medical Library. The documents include the Charter of Bartholomew, Bishop of Exeter, dated 1163 A. D., enlarging the endowment of the Leper Hospital of St. Mary Magdalene. There is also the Papal Bull of Pope Celestine III, dated 1192 A. D., confirming the charter. In the 14th century, there being few persons with leprosy the hospital was devoted to the care of old persons, especially to those who were scrofulous. The earliest medical book from the Exeter Library is the "Rosa Anglica" (14th century) by John Gaddesden and the incunabulum Celsus —"de Medicina" (1497). The former was given to the Cathedral Library in 1659. The second oldest printed book is the "Epistolarum Medicinalium" of Joannis Manardus (1462-1536), printed in Basle in 1535. Vesalius is represented by the version of "Epitome Fabricae Corporis Humanis" published by Plantin at Antwerp in 1566. The oldest surgical printed book in the exhibition is the "Opera in Chirurgia" (1534) of John Vigo (1460-1520). These are but a few of the treasures that make this exhibition of more than local interest.

General Practitioners in the National Health Service.—In a paper read at the Health Services Conference, Sir Humphrey B. Lindsay said that one result of the development of the specialist services has been to deprive general practitioners in some areas of the opportunities they enjoyed before the establishment of the Health Service for looking after their patients in the local hospitals. "There must be no iron curtain between general practice and the hospital service, and the need for economy—no less than the interests of the patient—makes it vital that there should be the fullest partnership between these two branches . . . it is a waste of the general practitioner's training if he is deprived of the chance to exercise the full range of his skill, and it is no less a waste of the specialist services if they are required to do what could be done as well, or better, by the general practitioner." Last August the Department of Health for Scotland recommended a procedure for making dual appointments to general practice and the hospital service, and Sir Humphrey urged that full advantage be taken of this opportunity. "The general practitioner is in a favourable position for seeing that the needs of the individual patient are met in the most economical way. He is able to make use of his intimate knowledge of the patient and the home conditions, which is perhaps especially valuable in some cases of mental illness."

Self-Inoculation with Poliomyelitis Virus.—An unusual case of poliomyelitis conveyed by accidental abrasion of a finger is reported by W. F. T. McMath (*Lancet* **1**:702, 1955). The patient, a laboratory technician aged 22, was engaged in a research unit. One of his duties was performing autopsies on animals dying after inoculation with poliomyelitis virus. On Nov. 1, while removing the spinal cord of a monkey that had died after developing paralysis following repeated intramuscular inoculations of a tissue culture of propagated M. E. F.-1 strain of virus (type 2), he sustained a small abrasion of a finger with a bone spicule. On the same day he was given 1.5 gm. of gamma globulin intramuscularly. On Nov. 9 he complained of headache and lumbar pain and was admitted to the hospital on Nov. 11. He was then found to have a temperature of 102 F, and Kernig's sign was present. On the next day there was tenderness and spasm of his abdominal and trunk muscles, which persisted for a week. On Nov. 25, lumbar puncture produced a fluid that contained 250 lymphocytes per cubic millimeter, 70 mg. of protein per 100 ml., 720 mg. of chloride per 100 ml., and 70 mg. of sugar per 100 ml. Culture was sterile. The complement-fixation antibody investigation on serum removed on the 3rd and 28th days of the illness did not support a diagnosis of recent systemic infection with poliomyelitis virus. Throughout his stay in the hospital the patient had indefinite weakness of the extensor muscles of both his hands. He was discharged home, recovered, on Dec. 12. The author concludes: "Poliomyelitis was not epidemic in the district; and it is reasonable to assume that the patient contracted poliomyelitis by infection through the accidental scratch. The administration of gamma globulin on the same day as the injury did not prevent the illness from developing after eight days' incubation, though it may have lessened its severity."

Youths in Coal Mines.—Two modifications in the conditions of employment of youths in coal mines will bring the practice in this country into line with the 1953 recommendations of the International Labour Office. The government proposes to give partial effect to the recommendation that prohibits the underground employment in coal mines of boys under 16 years of age. The law does not at present contain such a prohibition, but it is proposed that from July 1, 1957, no boy under the age of 16 may be employed underground except for certain training purposes to be prescribed by regulations. With regard to the recommendation that youths between the ages of 16 and 18 should not be employed underground in coal mines except for certain purposes or under certain conditions, the law and practice in the United Kingdom conform with the conditions laid down except that the permitted places of work are not directly prescribed by the government. In the government's view, however, the existing system of medical examination provides all necessary safeguards in this respect, and no change is proposed.

Sodium Carbonate Enemas Fatal.—On successive days in one hospital near London two patients died as a result of being given an enema of sodium carbonate instead of barium sulfate. On April 6 a man aged 68 was admitted to the hospital and sent to the x-ray department for a barium enema. According to the technician, who had been employed at the hospital since October, 1951, she prepared a mixture and added to it what was left over from the previous enema. This mixture was made from the contents of an unlabeled bag that she assumed to contain barium because of its position on the shelf. After the enema had been

given the patient vomited and complained of pain. He died the following day. The second patient, a woman aged 69, was admitted to the hospital on April 7 for radiological examination, which was carried out by the same technician. This patient complained of the same symptoms as the man and, like him, was dead within 24 hours. Immediately after the second death it was found that the unlabeled bag contained sodium carbonate. No one could tell just how it got placed on the shelf or how long it had been there, but a cleaner and general helper at the hospital stated that two or three months prior to the deaths after some decorators had left she had noticed that there were two bags on the shelf. The consultant radiographer told a member of the jury that there was no system of inspection in the department to see that no extraneous matter was lying about. The jury returned a verdict of accidental death.

Chicken Antiulcer Factor.—According to Dam and his associates, young chickens reared on an artificial diet develop ulcers in the gizzard. These may be severe and may perforate. They can be prevented by the inclusion in the diet of hog liver, calf's brain, or certain extracts therefrom. In collaboration with Dam, E. Meulengracht and his co-workers (Brøchner-Mortensen, E., and others, *Brit. M. J.* **1**:818, 1955) investigated the effect of these antigizzard ulcer factors in patients with peptic ulcer. A random sample of 82 patients with peptic ulcer was given, daily for four weeks, a granulate of ether extract of calf's brain plus one tablet containing 5 mcg. of cyanocobalamin and intrinsic factor corresponding to 1.8 gm. of fresh hog pyloric mucosa. A comparable group of 70 patients with peptic ulcer was subjected to the same regimen minus the antigizzard ulcer factors. At the end of the period of study there was no radiological or clinical difference between the two groups.

The Pharmaceutical Industry and the Health Service.—The annual report of the Association of British Pharmaceutical Industry for 1954-1955 shows that, of the $1,432,760,000 that is the estimated gross expenditure on the National Health Service in the fiscal year 1954-1955, 7.3% will have been received by the pharmaceutical industry for the drugs supplied to retail pharmacists, dispensing physicians, and chemists. The industry's present annual output amounts to 336 million dollars, of which 31.2% went to the National Health Service; 28.3% was devoted to proprietary medicines advertised to the public; 28% was exported; and 12.5% was devoted to veterinary and common household remedies.

FRANCE

Microelectrophoresis.—At a meeting of the Academy of Medicine, Professor Benhamou and his co-workers told of the part that microelectrophoresis plays in the diagnosis, prognosis, and treatment of pulmonary and extrapulmonary tuberculosis. An increase in the value of the serum alpha globulin occurs in the early stages, and an increase in the gamma globulin level is the sign of fibrosis, of chronicity, and of the increasing resistance of the host. At the same time the serum albumin level is normal or increased. A decrease in the albumin level goes with general debility. The tendency to fibrosis is attended with hyperbetalipidemia. The authors believe that mass microelectrophoresis is a valuable means of tuberculosis case finding. The treatment of tuberculosis must be continued until the proteinogram, the glucidogram, and the lipidogram return to normal.

Hodgkin's Disease.—At a meeting of the Medical Society of the Hospitals in Paris in October, 1954, Milliez and his co-workers reported the case of a 15-year-old girl who was treated with nitrogen mustard for one month and massive radiotherapy for three months. While they were trying a progressive treatment with cortisone, tuberculous meningitis developed and she died in less than eight days, in spite of energetic treatment. The authors believe that the massive radiotherapy followed by cortisone activated latent tubercle bacilli. Henceforth they intend to use x-rays only in small doses in treating Hodgkin's disease until the adenopathies disappear and to give streptomycin as a protective substance together with the cortisone.

PHILIPPINES

A New Journal.—A bimonthly scientific journal, the *Journal of Surgery, Gynecology and Obstetrics*, will be published jointly by the Philippine College of Surgeons and the Philippine Obstetrical and Gynecological Society. The editor is Dr. Luis Torres Jr.

SWEDEN

Lupus Erythematosus.—The application of the well-known antimalaria drug, quinacrine, to the treatment of lupus erythematosus has been advocated on the assumption that the yellow pigmentation of the skin provoked by it protects the deeper layers of the skin presumed to be morbidly sensitive to light in patients with this disease. At the skin department of the Holtermanska Hospital in Gothenburg, Fast and Westerberg gave this drug between January and September, 1953, to 35 patients suffering from chronic, discoid lupus erythematosus. Reviewing their experiences in *Svenska läkartidningen* for March 11, 1955, they note that the dosage was usually 100 mg. three times daily during the first week. During the second week it was 100 mg. twice daily and during the third week 100 mg. once a day. Thereafter 100 or 50 mg. was given every day or every other day for periods of different lengths. Excellent results were achieved in 25 patients, and in 5 others some slight improvement was noted. The remaining five did not respond to this treatment. In nine there were toxic reactions. In one patient a macular, intensely itching erythematous rash on both legs and up to the umbilicus developed. Two patients noted palpitation of the heart and two others dyspepsia. The patients suffered from depression, accompanied in one case by abdominal pain and diarrhea. The rash and depression necessitated the abandonment of the treatment in the patients showing this reaction. Other observers have reported patients with exfoliative dermatitis, aplastic anemia, agranulocytosis, and toxic psychoses in association with this treatment—hence their warning that treatment with quinacrine requires constant supervision of the patient.

Tuberculous Spondylitis.—In the quarterly journal of the Swedish National Association Against Tuberculosis (no. 1, 1955), Dr. Lars Maartenson reviewed the hospital records of all the patients with tuberculous spondylitis treated in the county of Skaane during the period 1900 to 1949. Although the frequency of this disease has fallen markedly in the present century, it has shown no fall whatever among persons over the age of 30. Among children the mortality was 45%, and 71% of these deaths occurred within 10 years of the diagnosis of the disease. Nearly all of these deaths were directly due to tuberculosis. A study of the deaths occurring within two years of the diagnosis of tuberculous spondylitis showed that the mortality was inversely proportional to the frequency of this disease, a finding that Maartenson interprets as showing that, in areas with a high tuberculosis morbidity, contacts with the disease imply vaccination against it. A follow-up study of all the survivors showed that, while about a quarter of all the patients were found to have completely regained health, with fitness for heavy work in many cases, 20% were still in need of permanent or temporary support by the community.

Death of Professor Kristenson.—Anders Vilhelm Kristenson was born on Nov. 17, 1888, and died of myocardial infarction on Nov. 7, 1954. In 1940 he succeeded Professor Jacobaeus to one of the two chairs of medicine at the Caroline Institute, with charge of the medical department of the Serafimer Hospital. Kristenson's most important early study appeared in 1924 and concerned the blood platelets. In 1926 he published studies on the pathogenesis of orthostatic albuminuria and varicocele. He took an active part in promoting vaccination with BCG. Though appreciative of sanatorium treatment, he was a keen advocate of ambulatory treatment for patients with tuberculosis, whose prognosis has been so greatly improved by modern chemotherapy. Kristenson acted as secretary general of the International Congress of Internal Medicine recently held in Stockholm. He was also one of the editors of *Acta medica scandinavica*.

CORRESPONDENCE

POLIOMYELITIS VACCINE

To the Editor:—Now that some of the hysteria surrounding the Salk vaccine has somewhat abated, may I say that, although the introduction of any medical innovation is most newsworthy, I cannot recall during my lifetime nor possibly even in the history of medicine so much hoopla as attended the announcement of the efficacy of the Salk vaccine. Immediately after this pronouncement, as if it were the most important edict, it appeared that every federal, state, and local official tried to attach himself to the vaccine as his personal property to be dispensed not as needed but as politically expedient. There seems to have been a contest between the public health officials and the other politicians as to who was the more important in distributing this "good" to the people. The National Foundation for Infantile Paralysis, which fathered some of the research, climbed over everyone else and possibly with capable press agents gained the most headlines, as if this manna was its private property. Like neophytes in the field of medicine, with the first flush of glory the foundation wrote off the problem of poliomyelitis and was ready to seek greener pastures. The Secretary of Health, Education, and Welfare quickly licensed the vaccine.

Soon the "bugs" appeared, and every official from high and low rushed to press, radio, or television and placed his foot in his mouth. No sooner was it known that some cases of poliomyelitis had occurred in some children who had received the vaccine than the surgeon general of the United States Public Health Service reaffirmed via television his confidence in the vaccine and stated that the cases were a coincidence. This important announcement was undoubtedly made, to say the least, without clear scientific thought. We all know the fumbling that followed this first statement and the final temporary cessation of the use of the vaccine. On the local scene everyone became magnanimous with the physician's time and skill. He was to administer the vaccine at cost; he was not to make a cent for his labor and/or skill. In the meantime the threatened strike at Parke, Davis & Company received comparatively little publicity, and certainly labor was nowhere admonished for its possible deterring effect on this most important boom. Local health commissioners announced that the vaccine should be administered gratis by private physicians. The only newspaper to come to the physician's side at this point was the New York *Daily News*, which stated editorially that the physician is worthy of his hire. S. Sokolsky and J. O'Donnell each wrote one article in which they stated that there was too much political interference with the poliomyelitis vaccine program.

The point of this letter is summed up in the following four statements. 1. It is deplorable that all of the information that the physicians have became available to them through the newspapers. There are medical journals in which a great deal of the scientific information could have been given. Certainly the statistical studies were available long before the date chosen to make the theatrical announcement. Most scientists are anxious to publish a preliminary report in order to establish their priority. Certainly, the scientists owe it to the medical profession to publish their findings so that they can be properly evaluated. Headlines make poor scientific communication. One might plead the urgency of this information. For something so earth shattering, THE JOURNAL could have used, if necessary, all of the following week's issue. To date I have not seen anything pertinent published in a medical journal. 2. Although the National Foundation for Infantile Paralysis is a laudable institution, it seems from its communiqués that it has overstepped its proper bounds regarding the announcement date, manner of announcement, and vaccine distribution. It will be a sad day for physicians and patients alike when there are enough foundations to each take unto themselves a disease and make a career of it. It is inevitable that he who controls the purse calls the tune, and foundations die hard. During the first gush of glory the National Foundation was already seeking another disease and tentatively picked the mental field. 3. As important and as erudite as the President of the United States is, he is certainly out of character and placed at a disadvantage when he has to reassure the public via the press conference that any vaccine has his stamp of approval. He placed the blame on the scientists for the "bugs" that developed, stating that maybe they were a bit hasty. The pressures of the foundation, the press, and the politicos were completely absolved of all fault. 4. During all this hoopla the physicians of this country were placed in an unenviable position. By direction or innuendo every physician was conceived as a blackguard, a potential black marketeer, and a vulture waiting anxiously to prey on unsuspecting children. Everyone is entitled to his opinion, but this is a flagrant abuse of the medical profession, and to compound this grievance not a responsible medical official or medical journal came to the defense of the physician. So-called organized medicine as embodied by the American Medical Association and for us in New York the state society were most negligent in their duty to the medical profession and specifically to their members.

I hope that from this near fiasco we have all learned something. Scientists should be left to their tasks and let medical men evaluate their results and use them to the best of their ability for the benefit of mankind. The politicos should keep to their own knitting and not try to make political capital out of medical problems. They are complicated enough without trying to intertwine politics with diseases. And lastly, foundations should raise money if need be and nothing else. Ideally there should be a general collecting agency and the money collected should be distributed according to strictly medical needs.

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To the Editor:—Epidemics of poliomyelitis appear to start in California, Arizona, New Mexico, and Texas, usually in March, and spread from there eastward and northward. Unfortunately, the Salk vaccine was not released until after April 12, when the epidemic had already begun. It is unwise to administer an agent to produce active immunity during the period when the disease is prevalent. Should the vaccine be given to a child who is incubating the disease, it is not unlikely that the effects of the antigen administered in the vaccine plus that developing from the incubating disease may overwhelm the immune mechanism and thus permit the development of active disease more often than if the vaccine were not used. The small number of cases fits in with this explanation much better than the supposition that the vaccine contained living virus and thus induced the disease. The fact that most of the cases developed in children given the vaccine manufactured by the Cutter Laboratory is not surprising when it is considered that this laboratory is located in California and is the only manufacturer situated in the western part of the country. It is logical to suppose that most of the vaccine given in this section of the country should be supplied by this manufacturer. If some other company were located in this part of the country, it is just as likely that their products would have been incriminated. I believe that the vaccine will be found safe to use. The difficulty is in the timing of its administration. This should be limited to interepidemic periods. In the Chicago area, if the second dose cannot be given by July 1, I believe it should be delayed until after the period of greatest incidence in the fall.

The whole situation has been badly mishandled, largely by the Foundation for Infantile Paralysis, and because of the terrific publicity built up on the part of the newspapers, radio, and television. The pressure of public opinion has forced action that may prove to be detrimental to the best interests of the public and may tend to discredit the value of the vaccine. The matter has been taken out of the hands of the medical profession. I severely condemn the unfavorable publicity that has reflected on the Cutter Laboratory before there is actual proof of fault.

The medical profession should take a definite stand in this matter and refuse to give the vaccine after June 1 until the end of the poliomyelitis season. Each physician should act as a publicity agent to his own patients, and I am sure this not only would redound to the best interests of his patients but would also lessen the mad rush for vaccine that is now taking place.

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DR. WILLIAMSON MISSING

To the Editor:—Dr. Lawrence M. Williamson has been missing from his residence in Garvin County, Oklahoma, since April 15. At the time of his disappearance he was enroute to St. Louis to inquire about a position in that city and had also mentioned that he might go on to Washington, D. C. Since the above date, no word has been heard by his family. We would appreciate

an early reply by either letter or collect call if you have any information concerning this man's whereabouts. According to his family, his disappearance is most unusual, as he has never been out of contact with them for any great length of time.

CLAUD B. SWINNEY
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APPRAISAL OF DRUG REACTIONS

To the Editor:—A recent editorial (New Drugs—Miracles or Mirages? *J. A. M. A.* **157:**1410-1411 [April 16] 1955) has very accurately defined the present state of medical thinking that follows the introduction of each new drug in therapy. The familiar pattern of enthusiastic reports, lethal side-reactions, and therapeutic paralysis are well known. Each new drug must be seen within the framework of its need, importance, and therapeutic possibilities. The use of chlorpromazine hydrochloride [10-(γ-dimethylaminopropyl)-2-chlorophenothiazine hydrochloride] and Rauwolfia serpentina in psychiatric treatment has occasioned renewed hope for thousands of hospitalized chronically ill mental patients. Reports of a rather alarming nature have tended to obscure their potential therapeutic possibilities and may well open a pathway for counter-attack by the therapeutic nihilists. This brief note proposes to study the major side-effects resulting from chlorpromazine therapy in psychiatry, on the basis of a recent survey of 4,360 patients in 14 psychiatric hospitals in England, France, and Switzerland (November-December, 1954) where this drug was in use and the study of 750 patients at Manhattan State Hospital, Ward's Island, New York City. The 4,360 patients referred to above received chlorpromazine in doses of 50 to 1,000 mg. daily for periods of several weeks to three years. Sixty-one cases of jaundice, 25 cases of skin rash, 2 cases of Parkinson syndrome, one case of convulsive seizure, and several cases of hypotension were reported. There were three deaths in the course of treatment, none attributed to chlorpromazine.

European authors have reported either no consistent change in the white blood cell count; an initial decrease in white blood cells, with drop in the eosinophils and rapid remission to normal several hours after the injection; an increased eosinophil count; leukocytosis with increased sedimentation rate; or no change at all. I encountered no case of agranulocytosis in any of the various European hospitals visited, in the foreign literature, or in our own series. Delay and Deniker (La Cure Neuroplégique, in Acquisitions Médicales Récentes, Paris, France, Editions Médicales Flammarion, 1954, pp. 105-115) who did the original work with chlorpromazine and whose experience now covers 1,000 patients (December, 1954), stated, "The changes in the blood picture are seen only in the six hours that follow the injection: disturbances of the white cell formula, a significant fall in the eosinophil level, testify perhaps to a slight biological shock related to the establishment of the neuroplegia. But afterward, even with indefinitely prolonged treatment, we have never observed any change in the white or red cell formulas, any agranulocytosis, or high degrees of leukocytosis such as those noted after sleep cures." Dr. F. Labhardt, at the Psychiatric Clinic of the University of Basle, Switzerland (Nov. 29, 1954) never saw a case of aplastic anemia after 23 months of experience with the drug in the treatment of 1,200 patients. If anything, he found a leukocytosis accompanying drug treatment. There have been no blood dyscrasias in 750 patients treated at Manhattan State Hospital for one week to six months.

Allergic skin reactions in nursing personnel have been noted in a rather alarming fashion in this country. Yet, European authors (Dr. Perrin, Hôpital du Vinatier, Lyons, France; Dr. Deniker, Hôpital St. Anne, Paris, France; and Professor Staehlin and Dr. Labhardt, University of Basle, Switzerland) have all made similar observations. The skin reactions were most often eczematous (hands and face) in the nursing personnel and urticarial in the patients. These reactions in members of the nursing staff were highest in those hospitals where the intramuscular route of administration was used and lowest where the drug was given orally. There is a difference in the incidence of jaundice found in England (1.8%), Switzerland (2%), France (0.003%), and the United States (about 3%). This discrepancy has yet to be explained, although dietary factors have been implicated. It is felt that the jaundice noted during chlorpromazine treatment is obstructive in type. Deniker has insisted on the possibility that antecedent liver or gallbladder disease (cirrhosis or cholilithiasis) may render the liver sensitive to chlorpromazine. The general experience abroad and at Manhattan State Hospital has been that jaundice clears with the cessation of therapy with the drug. In several of our patients, chlorpromazine therapy was inadvertently continued for a period of one to two weeks after the discovery of jaundice, with no deleterious effects. Where necessary, once the jaundice had cleared, chlorpromazine therapy was reinstituted without recurrence of toxic symptoms. The possibility of jaundice decreases progressively after the second to fourth week of treatment.

Parkinson symptoms have been rarely reported in Europe but frequently found in this country. These may be related to the longer duration of treatment in the United States. While interesting clinical phenomenon, they should be no deterrent to continue treatment with either chlorpromazine or Rauwolfia. Various anti-Parkinson agents have been successful in decreasing or abolishing symptoms during concomitant therapy with chlorpromazine.

It has been claimed that addiction may develop after chlorpromazine medication. I could not substantiate this statement in any hospital visited in Europe or in our own patients at Manhattan State Hospital. The recent "warning" by D. M. Weiss (Changes in Blood Pressure with Electroshock Therapy in a Patient Receiving Chlorpromazine Hydrochloride ['Thorazine']

Am. J. Psychiat. **111**:617-619 [Feb.] 1955) of "a disturbing vasomotor collapse" in a patient receiving chlorpromazine and electroconvulsive treatment is hardly conducive to a rational therapeutic approach. Apnea, cyanosis, collapse, and death have been noted more than once with electroshock therapy. Can this drug be implicated alone? The danger of "one case" reports with sweeping conclusions is evident.

About 2 million patients in the United States have received chlorpromazine and about 5 million patients throughout the world. The over-all incidence of these various rather frightening side-reactions reported to date must be very small. This, however, does not deny their importance. It has been suggested that complete serial blood studies should be carried out in patients receiving this drug. Such a procedure is hardly feasible in large hospitals where mass administration of the drug is used. At best it could possibly discover one case in many thousands, considering the world use of the drug. It can be predicted that severe reactions and fatalities will occur among hundreds of thousands of patients receiving any particular medication. It is of utmost importance to view these incidents in the context of the entire therapeutic situation. The whole question of side-reactions to chlorpromazine and, for that matter, Rauwolfia has been stressed out of all proportion to the problem and is tending to obscure the rather unusual potentialities of these drugs in management of mental patients. Continued reports of lethal reactions in "one case" will activate unconscious anxieties and fears and, in the long run, induce a profound therapeutic inertia. Psychiatry can ill afford such a state at this time.

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SOLICITATION OF REPRINTS

To the Editor:—I think that the time has come to say something in defense of the "solicitation of reprints," which has been condemned editorially in at least two prominent journals recently (*J. A. M. A.* **157**:1411 [April 16] 1955. *New England J. Med.* **252**:644 [April 14] 1955). It has been said that large numbers of rather inconsiderate doctors have deluged authors with terse printed post cards demanding a reprint of a particular article. I have no argument with the above. It is without doubt quite factual. However, I do think that an opportunity to do something constructive about the situation has been passed up.

By way of identification, I am one of the villains who uses the printed post cards. I usually request between one and six reprints per month by this method. I want to defend this system of accumulating valuable information. I was taught in medical school that one of the best ways of maintaining an up-to-date ready reference source was by filing all pertinent articles. Since one cannot take all journals, he misses many good articles unless he periodically skims through some of the journals he does not subscribe to. Skimming the library journals helps locate useful information, but months later, when the same information could be helpful, the necessary details are only as close as the nearest medical library. However, if one has the reprint available and on file, the information is at hand and the patient benefits. I am just finishing my internship now and have a good medical library just two floors down, but in a few months I am going to be engaged in general practice in an area where there is no library conveniently close by. However, I have been clipping journals and sending for reprints, and I have a four-drawer file that is far more complete and more up-to-date than any medical textbook. It is the isolated practitioner, perhaps, who stands to benefit most from such ready access to current information.

I agree that we should not so enrich our own sources at the expense of the authors, but I think we would stand to lose considerably if the reprint idea were abandoned or even trimmed significantly. I think that a practical method of continuing this excellent means (reprint dissemination) of postgraduate education might be suggested rather than pleading for its discontinuance by the "post card group." Incidentally, I do not think a printed post card requesting a reprint necessarily suggests lack of interest—more likely it means that the sender is reading journals regularly and is frequently interested enough in an article to request a copy for his own use. It seems to me that it would not be too difficult to arrange a method for defraying the costs of reprints. For instance, as the *New England Journal of Medicine* recently suggested (**251**:1032 [Dec. 16] 1954), the individual journals might make reprints available to the medical public at a price that would make the project self-supporting. I would imagine that, with a Multigraph or some such similar device, reprints could be produced for a price not greater than 25 or 50 cents. If this proved too complicated, perhaps we could arrive at a proper price and send the fee directly to the author with the reprint request (in an envelope with the printed post card). I would be glad to pay a fair fee for reprints. It still would be an inexpensive, easy way to continue my education.

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RUPTURE OF AORTIC ANEURYSM INTO ESOPHAGUS

To the Editor:—I refer to a letter to the Editor in THE JOURNAL, Dec. 26, 1953, page 1571, by Dr. Samuel Baer, who questions the rarity of gastrointestinal hemorrhage due to rupture of aortic aneurysm into the esophagus, since only five cases have been described in the world literature in the past 27 years. The subject has evidently been neglected as a cause of hematemesis. Following is a report of one case. Our patient, a woman aged 84, was seen at 8 p. m. on Feb. 19, 1954, for a 200 cc. (estimated) emesis of bright red blood. No evidences of shock were apparent. The patient was hospitalized for investigation. Gastrointestinal x-ray studies, including stomach and colon, for causes of the bloody emesis were normal. No ulcers, esophageal varices, or diverticula were found, and cardioesophageal herniation was not demonstrated. X-ray examination of the chest revealed considerable pleural thickening of the left base, with a small amount of fluid, bilateral pulmonary fibrosis, old calcified tuberculous deposits in the upper right and left lobes, and considerable ectasia of the aorta. Blood pressure was within normal limits. The hemoglobin level fell to 11 gm. per 100 cc. Erythrocytes were 3,400,000 per cubic millimeter. In five days blood in the stool disappeared. An electrocardiogram showed myocardial damage. Results of urinalysis were normal. Bleeding, clotting, prothrombin time, and platelet counts were normal. The clinical diagnosis was gastritis with hematemesis.

The patient's condition was good, and she was to be discharged. At 6 p. m. on Feb. 27, 1954, the patient had a massive hemorrhage of bright red blood through the mouth and nose and died. Postmortem examination revealed the stomach to contain 2,000 cc. of clotted blood. Ten centimeters above the junction of the esophagus and stomach there was a small, 1 cm., lesion filled with blood clots. Dissection of this perforation showed it to connect with an aneurysm of the aorta. This aortic aneurysm was 4.5 cm. in its greatest dimension. It was filled with old blood clots and communicated with the aorta through an opening 1.5 cm. in diameter. The diagnosis of aortic aneurysm with perforation and rupture into the esophagus was made.

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SIRACH AND MAIMONIDES

To the Editor:—In Miscellany in THE JOURNAL of March 26, page 1158, two errors appear: 1. Sirach did not write his Book of Ecclesiasticus in the third century A. D. He lived in the second century B. C. 2. Maimonides was not an Islamic philosopher. His philosophy was based on Judaism and Aristotle. He was also a physician to the court of Saladin and chief rabbi of Egypt.

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MEDICINE AND THE LAW

The Judicial Council has authorized the publication of the following opinion. This opinion and others approved by the Judicial Council, will be published in "Medicine and the Law." These opinions will eventually be compiled and published separately as annotations to the Principles of Medical Ethics.

Question: A member of the American Medical Association has asked: After a member of a medical group or partnership has died, may the group or the remaining partners retain the name of the deceased on their office door, their stationery, in the telephone directory, and in other places?

Opinion: Chapter I, section 4 of the Principles prohibits solicitation of patients, describes the most effective advertising and recognizes that local customs influence the use of proper advertising. The Judicial Council is of the opinion that the continued use of the name of a deceased member of a group or partnership by those who continue the medical practice of that group or partnership is not of itself a violation of the Principles, if such practice is not contrary to local custom or the law of the community. The practice becomes unethical if it misleads or deceives the public, if it offends against local custom and ideals, or if it is contrary to law. Whether such practice tends to or does deceive or mislead depends on all the facts of each situation and includes both the intent of the user and the anticipated effect such practice will have in the particular community. Only the component medical society can ascertain these facts and determine from them whether the practice is or is not in violation of the spirit and intent of the Principles. The Council is of the further opinion that better practice dictates, if the name may properly be used, some means to indicate that the former member is deceased; for example, John Doe, M.D., 1880-1954. In passing, the Council expresses the feeling that in some exceptional situations the continued use of the name of the deceased by his surviving associates may well be a fitting tribute to the memory of one who contributed materially to the advancement of medicine.

LAW DEPARTMENT

TAX DEDUCTION OF PROFESSIONAL ENTERTAINMENT EXPENSES

Although the tax court[1] appears to have recognized that physicians may incur validly deductible expenditures for entertainment that is ordinary and necessary in the practice of medicine, the American Medical Association has received complaints that internal revenue agents in some instances refuse to recognize any deductions for "business" entertainment. These agents have contended that such expenditures are "unethical" and consequently not deductible. In some instances agents are reported to have made the assertion that the American Medical Association considers expenditures for business entertainment as unethical.

To correct this misunderstanding, Dr. Lull sent the following letter to the Commissioner of Internal Revenue, T. Coleman Andrews, on Feb. 21, 1955:

"We have received complaints from various parts of the country to the effect that Internal Revenue Agents have taken the position, in examining the returns of physicians, that business entertainment expenses are not allowable deductions for physicians. These agents contend that such expenditures are 'unethical' and hence not valid deductions for Federal income tax purposes. In some instances, we are informed, the agents even go so far as to assert that the American Medical Association considers such expenditures as unethical.

"In an attempt to clarify this same situation, the Judicial Council of the American Medical Association, which has the responsibility of resolving questions of medical ethics, issued a formal report in 1951 regarding business entertainment expenses, in which it stated: 'The Council does not consider such expenditures as per se unethical. There are circumstances under which a professional obligation may rest on a physician to entertain other physicians. It is a usual and necessary concomitant of the practice of medicine. It is certainly not an uncommon practice and is recognized by the profession generally as entirely proper and justifiable.'

"This report was unanimously adopted by the House of Delegates of the American Medical Association.

"We believe that the same standards applicable to lawyers, architects, engineers, and other professional men, or business men in general, should be applied in the tax recognition of a physician's business entertainment expenses.

"We would appreciate your action in informing those charged with the responsibility of examining tax returns, that it is not unethical for physicians to incur legitimate business entertainment expenses and that the American Medical Association does not consider the incurrence of such expenditures as unethical or contrary to public policy. Please advise us as to your disposition of this matter."

On March 2, 1955, an acknowledgment of Dr. Lull's letter was received, and on April 21, 1955, a reply was received in which the director of the audit division of the Internal Revenue Bureau agreed to call the attention of his field personnel to the "circumstances" cited in Dr. Lull's letter. It will be noted from this reply set forth below that the substance of the position of the American Medical Association is not challenged:

"This is in further response to your letter of February 21, 1955, addressed to Commissioner Andrews, relative to the position being taken by internal revenue agents that business entertainment expenses claimed by physicians on their Federal income tax returns are 'unethical' and, consequently, not allowable. You have been informed that in some instances our agents have asserted that the American Medical Association itself considers such expenses as unethical.

"You state that your association does not consider legitimate entertainment expenses incurred by physicians in the pursuit of their profession as either unethical or contrary to public policy, and you believe that in the examination of income tax returns physicians should be accorded the same treatment as that accorded other professional men, or business men in general.

"Under the circumstances you request that those internal revenue agents responsible for the examination of income tax returns be advised accordingly.

"The administration of the provisions of Section 23a(a)(1)(A) of the Internal Revenue Code for 1939 (Section 162 of the Internal Revenue Code for 1954), which allows 'ordinary and necessary expenses paid or incurred during the taxable year in carrying on any trade or business,' involves a factual determination. Accordingly, the allowance of such expenses must be based upon the facts in each case. Since you did not call to our attention any specific cases, we are not in a position to determine whether entertainment expenses have in any instance been improperly recommended for disallowance.

"In order, however, to insure uniform application of this provision of the law, the circumstances which you have recited will be brought to the attention of our field people.

"Thank you for calling this matter to our attention."

Physicians whose professional entertainment expenses have been challenged as "unethical" may find support from this correspondence in dealing with revenue agents.

1. Richard A. Sutter, et al., 21 T.C. 170. Bernard L. Shackleford, 7 T.C.M. 694.

MEDICOLEGAL ABSTRACTS

Osteopathy: Right to Practice Surgery and Administer Drugs.—The plaintiffs, licensed practitioners of medicine and surgery in West Virginia, sought to enjoin the defendant, a licensed osteopathic physician and surgeon, from performing surgery or administering and prescribing drugs, medicines, and narcotics. From a judgment overruling the defendant's demurrer, the defendant appealed to the Supreme Court of Appeals of West Virginia.

In West Virginia physicians and surgeons are governed by one law, and osteopathic physicians and surgeons are governed by another. The plaintiffs contended that the act governing osteo-

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195

paths does not explicitly authorize osteopaths to do the acts sought to be enjoined, whereas the act governing physicians and surgeons does authorize those licensed under it to treat "any human ailment or infirmity by any method." The plaintiffs further argued that the medical practice act forbade, by negative inference, osteopaths from practicing medicine and surgery in West Virginia by virtue of its provision that "The following persons and no others shall hereafter be permitted to practice medicine and surgery. . . ." Osteopaths were not among those named. The defendant, on the other hand, contended that under the osteopathic practice act he was authorized to perform such acts since the educational requirements of the act compelled those seeking a license to study practically the same subjects as those seeking to become physicians and surgeons. In addition, this act states that "Osteopathic physicians and surgeons licensed hereunder shall have the same rights as physicians and surgeons of other schools of medicine with respect to the treatment of cases or the holding of office in public institutions."

The Supreme Court said that in the absence of a prohibitory statute, every person has a right to engage in the practice of medicine. This right, however, is subject to the exercise of the police power of the state in the protection of the public health. If the legislature had intended that licensed osteopathic physicians and osteopathic physicians and surgeons should be prohibited from prescribing and administering drugs, medicine, and narcotics and performing surgery, it would have expressly so provided. This it did not do, and, having placed restrictions on the practice of dentistry, nursing, optometry, and chiropractic, the fact that the legislature did not in express language prohibit the use of drugs, medicine, and narcotics or the performance of surgery by those engaged in the practice of osteopathy, though not controlling, strongly evinces a legislative intent that osteopathic physicians and osteopathic physicians and surgeons should not be prohibited from prescribing and administering drugs, medicine, and narcotics, or performing surgery. Especially is this true, the Court continued, in view of the fact that the prescribed curriculum embraces the study of anatomy, embryology, chemistry, histology, physiology, surgery with emphasis on fractures and dislocations, principles of surgery, surgical diagnosis, orthopedics, orificial and chemical, obstetrics, and pathology; and the curriculum prescribed for the study of osteopathy includes diseases of the nervous system, alimentary tract, heart and vascular system, genitourinary diseases, ductless glands and metabolism, respiratory tract, bone and joint diseases, corrective gymnastics, acute and infectious diseases, pediatrics, dermatology, syphilis, psychiatry, and diagnosis.

In the enactment of laws relating to the regulation of the practice of medicine and surgery and the practice of osteopathy, the legislature had the over-all purpose of protecting and preserving the public health, and, rather than exhibiting an intent to construe these statutes separately, the legislature evidences the clear intent that the two statutes should be read in *pari materia*.

We therefore hold that the defendant, Glenn E. Cobb, having been duly licensed to practice as an osteopathic physician and surgeon, has the right in the practice of his profession to treat "any human ailment or infirmity by any method," as physicians and surgeons may do.

In so holding, this Court fully realizes that this case involves a highly controversial question, in the solution of which the minds of the members of the medical and osteopathic professions may differ widely. We simply say that the legislature originally invoked, as it had the right to do, the police power of the state. Whether the legislature was well advised in so doing, it is not for this Court to say. This Court should not, and will not, control the policy of the legislature in the valid exercise of the police power of the state pertaining to the public health. Our duty is simply to interpret the statutes of this state when they involve inconsistent provisions, and to apply the statutes when they are clear and unambiguous; and only where an act of the legislature contravenes the provisions of the constitution of this state does it become the duty of this Court to declare a statute unconstitutional.

Accordingly, the judgment in favor of the plaintiffs was reversed. *Vest v. Cobb, 76 S. E. (2d) 885 (W. Va., 1953).*

Osteopathy: Right of Osteopath to Practice in County Hospital.—The board of trustees for the Audrain County Hospital filed suit for a declaratory judgment to determine whether or not a rule adopted by it was legal. The state medical association, the Missouri Osteopathic Association, and the medical and osteopathic physicians of Audrain County were joined as defendants. The trial court held that the rule was illegal, and an appeal was subsequently taken to the St. Louis court of appeals, Missouri.

A Missouri statute regulating county hospitals provides that in the management of such hospitals "no discrimination shall be made against practitioners of any school of medicine recognized by the laws of Missouri and all such legal practitioners shall have equal privileges in treating patients in said hospital," and further that "The patient shall have the absolute right to employ at his or her own expense his or her own physician. . . ." Until 1940, osteopaths were permitted to practice in the Audrain County Hospital, but at that time the board adopted a rule excluding doctors of osteopathy from practicing in the hospital. The rule was publicly criticized, and consequently, the board filed the present action. Evidence was introduced to show that the school of medicine known as osteopathy had existed in Missouri since 1894, when the American School of Osteopthy was founded. The express purpose of that school was to advance the theory that a well-balanced distribution of blood throughout the body tended to produce a general state of healthfulness and that such a distribution of blood could be brought about by physical manipulation. As time passed, the scope of the subjects taught at the school broadened until, at the present time, its graduates engage in the practice of general surgery, the administration of drugs, and manipulation. Since 1897, osteopaths in Missouri have been subject to various statutes regulating their practice and admission to practice. On appeal, the board urged the court to find its exclusionary rule lawful and also to render an opinion defining the scope of the practice of osteopathy.

The court of appeals held that the board's request for a definition of the scope of the practice of osteopathy was beyond its jurisdiction, since the suit was brought merely to determine whether or not the board had the lawful power to adopt the disputed rule. In construing the rule-making power of the board, the court relied on definitions of the terms "school" and "medicine." The first was defined as "The standards, doctrines, or principles relating to a profession or occupation in a given locality . . ."; the second as "The science and art dealing with the prevention, cure, or alleviation of disease." In prior decisions, the courts have treated and referred to osteopathy as a school of medicine. The legislature referred to osteopathy as a school of medicine in enacting regulatory statutes. The law governing osteopaths refers to them as physicians. The court of appeals, therefore concluded that the board's exclusionary rule was unlawful, since it discriminated against a legally recognized school of medicine and in effect deprived patients of the services of physicians of their own choice.

Accordingly, the judgment in favor of the osteopaths was affirmed. The court refused, however, to determine the scope of osteopathic practice because it felt that such issue was not properly before it for determination. *Stribling v. Jolley, 253 S. W. (2d) 519 (Mo., 1952).*

Medical Books: Use in Cross Examining Expert.—The plaintiff sued for damages for the loss of his left arm allegedly due to the negligence of the defendant physician. From a judgment for the defendant, the plaintiff appealed to the United States court of appeals, fourth circuit.

The plaintiff was involved in an automobile collision on Aug. 29, 1950, and was immediately taken to the Mary Washington Hospital at Fredericksburg, Va. He was suffering from, among other things, a compound comminuted fracture of the left elbow that involved the bones of the upper and lower parts of the arm. The defendant physician cleaned the wound, removed unattached fragments of bone, straightened the arm, applied a cast, and administered antitetanus serum and penicillin. After three days the plaintiff left the Mary Washington Hospital and entered the Martinsville General Hospital at Martinsville, Va., where he was placed under the care of another physician. Subsequent diagnosis revealed a gas gangrene infection, and to counteract this

the plaintiff was given x-ray therapy, penicillin, and gas gangrene antitoxin. The condition failed to disappear, however, and an amputation of practically the entire left arm was necessary. The plaintiff contended that the defendant had acted negligently in failing immediately to give him gas gangrene antitoxin and in releasing him from the hospital within three days. The plaintiff also maintained that the trial court had erred in not allowing his attorney to refer to certain medical textbooks while cross examining the defendant.

The use of a scientific treatise in the cross examination of an expert witness on the stand for discrediting purposes has been generally repudiated in the past. There is, however, a substantial body of authority that holds that, when a witness is testifying as an expert, it is competent to test his knowledge on cross examination by reading to him extracts from scientific authorities, which he recognizes as standard upon the subject matter involved, and then ask him whether he agrees or disagrees with what has been read. As was said by the Supreme Court of the United States, "It has been pointed out that the doctors' expert evidence rested on their professional knowledge. To some extent this knowledge was acquired from medical textbooks and publications, on which these experts placed reliance. It certainly is illogical, if not actually unfair, to permit witnesses to give expert opinions based on book knowledge, and then deprive the party challenging such evidence of all opportunity to interrogate them about divergent opinions expressed in other reputable books." The court of appeals therefore held that the attention of an expert may be called in the course of cross examination to statements in conflict with his testimony, contained in relevant scientific works, which he recognizes as authoritative.

Accordingly, the judgment for the defendant physician was reversed and the case remanded for a new trial. *Lawrence v. Nutter, 203 F. (2d) 540 (U. S., 1953).*

Prenatal Injuries: Liability for Injuries Received Prior to Birth.—The plaintiff, as personal representative, filed suit for damages against the defendant for negligently causing a personal injury resulting in the death of the plaintiff's child. The suit was dismissed by the trial court, so the plaintiff appealed to the Supreme Court of Illinois.

The plaintiff alleged that as a result of the defendant's negligent operation of his automobile, the cars that the plaintiff and the defendant were driving collided. At the time of the accident, the plaintiff was pregnant with a fetus that was viable and capable of extrauterine survival. The collision caused such injuries to the fetus that it died shortly after being born alive. The trial court held that these allegations failed to state a cause of action, relying upon a decision rendered by the Supreme Court of Illinois in 1900. The plaintiff contended that such prior decision should be overruled.

The defendant argued that Illinois common law precedents forbade any recovery for prenatal injuries to a child. The Supreme Court reviewed the many opinions on this issue that have been made since 1900. As they emerged from the many opinions in consideration of the problem, the chief grounds urged in support of the rule denying a viable child a right of action to recover for prenatal injuries have been (1) the lack of precedent, (2) the difficulty of determining the existence of a causal relation between a prenatal injury and the death or the condition of the child and the consequent possibility of fictitious claims, and (3) the absence of a duty to the unborn child because it is thought to have no separate being apart from its mother.

Four principal reasons were advanced in support of allowing recovery where the injuries occur when the child is viable. 1. An unborn viable child, being capable of independent physical existence, should be regarded as a separate entity from the mother. 2. The law recognizes the separate existence of an unborn child for the purpose of protecting his property rights and protecting him against criminal conduct. 3. A wrong is inflicted for which there is no remedy, unless there is recognition of the legal right of a child to commence life unimpaired by physical or mental defects caused by the negligence of others, while it was a viable child *en ventre sa mere.* 4. Lack of precedent should not bar recovery where a wrong has been committed.

Turning then to the reasons that have prompted the denial of recovery, we consider first the alleged lack of common-law precedent. It has been said that Justice Holmes, unable to find any precedent for the action for prenatal injuries, believed that the common law afforded no remedy, whereas a more accurate statement would have been that there was no English authority on either side of the question. If we were considering a case of first impression anywhere, we would be unable to find that the common law denied the right. On the contrary it would appear that, insofar as there was any common law on the subject, the right would be recognized under the general theory *ubi jus ibi remedium.*

The argument based upon the difficulty of proof of a causal relation between the injury *en ventre sa mere* and the damage that subsequently becomes apparent has likewise been rejected. It is probable that this would have been almost insurmountable in the days of Coke, Hardwicke, and Blackstone, and perhaps of Holmes, and may have influenced their conceptions of the law. Physicians of today would have less trouble with the problem, but, apart from this, the right to bring an action is clearly distinguishable from the ability to prove the facts. The first cannot be denied because the second may not exist. Fraud can be dealt with in this class of cases, just as in others, and the detection and the elimination of faked contentions present no novel question to judicial bodies.

The third ground upon which recovery has been denied is the assumed identity of mother and unborn child and the consequent absence of any duty to the child. The fact is that the infant lives with its mother while in its prenatal state rather than being a part of the mother. All authorities agree that at some time during the period of gestation, the infant, yet unborn, reaches a stage of development where it can live outside of the mother.

To deny the infant relief in this case is not only a harsh result, but its effect is to do reverence to an outmoded, timeworn fiction not founded on fact, and within common knowledge, and untrue and unjustified.

Upon a reappraisal of the question, said the Supreme Court, we conclude that the reasons that have been advanced in support of the doctrine of nonliability fail to carry conviction. We hold, therefore, in conformity with the recent decisions that the plaintiff, as administratrix of the estate of a viable child, who suffered prenatal injuries and was thereafter born alive, has a right of action against the defendant, whose alleged negligence caused the injuries.

Accordingly the Supreme Court reversed the judgment in favor of the defendant and remanded the case to the trial court. *Amaan v. Faidy, 114 N. E. (2d) 412 (Ill., 1953).*

MISCELLANY

THE LIGHTER TOUCH

Today's physicians have been accused of being engrossed so completely in the science of medicine that they have lost their interest in culture. They are supposed to have retreated from the broad educational background that in a former day was one of the features that distinguished the physician from the average layman. Therefore, it is worth noting that physicians individually and in groups still contribute to the liberal arts, even if it is generally as amateurs. Annual exhibits of paintings by physicians are encouraging signs of the trend. Music has its active participants. Many individual performers and groups of doctors play chamber and symphonic music. Others have more than the average hobbyist's interest in high fidelity recordings. In addition to a considerable and distinguished company of physicians who have forsaken medicine for the muses, there are still some who borrow time from the busy life of medical practice to write prose or verse. A recent addition to this small but not still voice demonstrates that, both in its own right and as an arouser of latent poetic tendencies in many physicians, satirical or light verse enlists contributors from among the large family of physicians. In a recently published booklet entitled "Omphalosophy and Worse Verse," which is reviewed in this issue of THE JOURNAL (page 616), the navel becomes a target

on which to pin medical foibles, follies, and fatuities. The light verse is developed with whimsicality, satire, and often strange rhyme and rhythm. One pleasant reaction has been a number of critiques, compliments, and book reviews in verse, uncovering hidden talents in other physicians. It is rumored on good authority that this minor epidemic of verse in response had its beginning when an illustrated version of "Omphalosophy" was given to the undergraduate students at Guy's Hospital in London disguised as a clinical lecture. This called forth rhymes of approval and congratulation, as well as amazement. This collection of quip and irony gives those interested in a light approach to serious matters an opportunity to get entertainment as well as food for thought.

Walter Martin wrote to the author:

> Your book of rhyme came just in time
> To lighten my frustration
> From solemn thought that came to naught
> On saving of the nation
>
> For strange enough, this kind of stuff
> To me is most appealing
> Another ear, Oh Sir, my dear
> May have quite different feeling
>
> The solemn kind that do not find
> Relief from joy and laughter
> Had best be strung up one by one
> From a convenient rafter.

In the January number of the *Journal of Iowa State Medical Society*, Herman J. Smith wrote a review in these words:

> What laughter rocks the college halls!
> What glee from ivory tower falls!
> Here professorial dignity
> Is flung aside for all to see.
>
> From laboratory and from clinic
> Comes these gibes of the bedside cynic.
> Here are puns made sans contrition,
> Medical whimsy and erudition.
>
> Some might think this book of verse
> Lusty, raucous—even worse;
> But in the mind of this reviewer
> To the pure, all things are pure.
>
> L'Envoi
> While coaches get free Cadillacs,
> 'Tis plain that business sense Bean lacks
> To pick the brains of this famed scholar
> The cost is only half a dollar!

And to round out the picture the following quotation from the Guy's Hospital *Gazette* (No. 68, July 24, 1954, p. 300) is:

> OMPHALOSOPHY
>
> SIR,
> Most students were quite cynical
> Before the lecture clinical
> On Tuesday, by a Doctor Bean
> Whom none of us had ever seen.
>
> His lecture was historical
> In that it was poetical—
> There's not a man from Guy's who'll claim
> Whole lectures in poetic vein.
>
> His subject was, strange to relate,
> The umbilicus and its fate.
> His witty verse brought great applause
> When he addressed the Dinosaurs.
>
> Two brains they had he firmly said,
> One in the rear, one in the head.
> The umbilicus lay between,
> Which plainly made it King and Queen.
>
> An hour was spent with this, his fable
> About all aspects of the navel.
> The scanning was in places hazy;
> The verse itself, at times, quite crazy.
>
> The students were most laudable
> In their response quite audible
> On Tuesday, to a Doctor Bean;
> Whom all of us have gladly seen.
>
> Yours etc.,
> Doggerel

HOW TO MAKE SURGERY PAY

Richard Gordon

Reprinted with permission from Punch *(July 28, 1954).*—ED.

Old Blood and Thunder, the forthright frock-coated man who taught me surgery, was once pressed at short notice, to take over a lecture on *The Ethics of the Relationship Between the Doctor and His Patients.* The subject clearly puzzled him. He was like a squire committed to speak on the ethical relationship between the sportsman and his partridges: "Gentlemen," he declared, gripping the lectern firmly, "I have only two pieces of advice to give you. First—remember that major surgery means minor gratitude. Save the patient's life, and he'll complain his stitches tickle, the nurses have cold hands, there are breadcrumbs in his bed, and your bill's outrageous. But tidy up his hammer toes and hernias, and he'll be your devoted slave for life.

"Second—you hear a lot of damn nonsense at meetings about letting your patients know what's wrong with 'em and what you're going to do about it. Fiddlesticks! Take my advice, gentlemen. Cut it out and tell 'em nothing." He then went on to give an enthusiastic lecture on the surgical pathology of the kidney.

As Blood and Thunder often turned purple over his morning *Times*, I wonder how his blood pressure would have responded to the cases that now make the Law Reports read like columns from the *Lancet*. No patient dared think of suing Blood and Thunder—he made his mistakes, but his attitude at the bedside automatically turned them into Acts of God. If a nervous patient asked at the end of one of his graphic clinical demonstrations "What's *wrong* with me, doctor?" Blood and Thunder slapped a hand on his shoulder and boomed "You leave all that to me, laddie!"—which immediately made his victim feel better. All that patients in his wards learned of their forthcoming treatment was that they would be operated upon on a Friday; several thousands of them must have passed through his hands with no more idea of their disease and what had been done for it than the dazed survivors of a severe accident.

But the modern patient knows his rights. Old Blood and Thunder could have left his umbrella inside and got away with it; if a man wakes up to-day from a major operation with a safety-pin sticking in him, he's off to Lincoln's Inn as soon as he can walk. He's only to cough over the jury and limp into the witness box and the Court has awarded £10,000 damages against the surgeons, who seem to have ousted the daily papers as the regular supporters of litigants.

The medical profession could easily cure this forensic fever by applying its first principle of therapeutics—that prevention is better than cure. This is clearly how a surgeon should take a ward-round with his students in a modern hospital:

"Now, gentlemen, we come to this lady, Mrs. Smith. I have made a diagnosis of chronic tonsillitis, and explained to her with coloured drawings all the complications of the operation of tonsillectomy mentioned in *The Encyclopædia of Surgical Practice*. We must now decide whether to operate or not, and I shall therefore hand over the case as usual to my learned friend."

Adjusting his freshly-sterilized wig and gown, the hospital's senior Q.C. approaches the bedside.

"There are two tonsils, are there not?" he demands of the surgeon.

"Yes, two."

"Both would be removed in the operation of tonsillectomy, would they not?"

"That is correct."

"I put it to you, that part of either tonsil might well be left behind at the operation?"

"Oh, a microscopic fragment—"

"Answer yes or no."

"Yes."

"This fragment might possibly grow into another tonsil, might it not?" (No answer.) "In my opinion operation is contra-indicated."

"There you are," the surgeon says cheerfully to the patient. "I know you'll have a beastly sore throat for the rest of your life and probably choke to death, but that's all we can do for you. Good afternoon."

The alternative is to start suing the patients if they don't get better. Or let them hear another of Blood and Thunder's surgical maxims—"If you *do* make a mistake, gentlemen, make a damn big one. It's the little ones that mean law courts. It's really very much cheaper to knock 'em off."

MEDICAL FILM REVIEWS

The Technic of Joint Aspiration and Injection of Hydrocortisone: 16 mm., color, sound, showing time 12 minutes. Prepared by Joseph Lee Hollander, M.D., Arthritis Clinic, Hospital of the University of Pennsylvania. Produced in 1953 by Medi-Cine Productions, Inc., for Merck & Co., Inc. Procurable on loan from Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa.

This film illustrates the technique of intra-articular injection of hydrocortisone in the treatment of arthritic joints. It also presents information on clinical results. The technique of aspiration and injection is well visualized. This is justifiable therapy, and it is particularly mentioned that this is only temporary relief. It is probable that the technique of injecting the hip and shoulder joints is oversimplified, since these joints are very difficult to inject. No postoperative cases are shown, and the final sequences showing skeletal landmarks are far too brief to be of any practical value.

Radical Surgery for Advanced Lung Cancer: 16 mm., color, sound, showing time 32 minutes. Prepared by Adrian Lambert, M.D., Bellevue Hospital, New York. Produced in 1954 by and procurable on rental from Sturgis Grant Productions, 322 E. 44th St., New York 17.

This film presents an operation for advanced cancer of the lung, a procedure that is still in a developmental stage. There has been as yet no universal agreement as to how often this radical procedure should be used; however, the underlying principles on which the operation is based are demonstrated by the film. Three patients are used to demonstrate various aspects of the procedure. In each case an x-ray of the chest, with animated arrows, is used to demonstrate the pathology within the thorax. At the beginning of each case report a text, both typed and narrated, is used. The position of the patient on the operating table is shown, as well as the technical procedures of going through the chest wall and removing the lung. By the use of three patients for the demonstration, the procedure is shown throughout in considerable detail. In two patients involvement of adjacent structures by the tumor caused the operation to be abandoned; however, in the third case it was completed. In this patient involvement of the chest wall necessitated removal of several ribs and intercostal structures, along with all mediastinal nodes and the right lung. This case demonstrates the lack of restriction of motion of the upper extremity on the side of operation four weeks after operation. Narration of the procedure is quite good, and the photography as to both clarity and exposure is satisfactory. This film would be of value to residents in training and to practitioners of thoracic surgery.

NEW FILMS ADDED TO A. M. A. MOTION PICTURE LIBRARY

Stop Rheumatic Fever: (Cleared for television): 16 mm., black and white, sound, showing time 12 minutes. Produced in 1954 by Transfilm Incorporated for the U. S. Department of Health, Education, and Welfare, Public Health Service, National Heart Institute, in cooperation with the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association. Procurable on purchase ($15) from American Heart Association Film Library, 13 E. 37th St., New York 16, and on loan (service charge $1) from Committee on Medical Motion Pictures, American Medical Association, 535 N. Dearborn St., Chicago 10.

The purpose of this film is to impress upon parents, teachers, and the general public the fact that rheumatic fever can be prevented by preventing and treating streptococcic infections. These infections, which cause sore throats, tonsillitis, scarlet fever, and other diseases, are the forerunners of rheumatic fever. In the film, a smoky flame is used as the symbol of rheumatic fever, which, like a flame, flares up and subsides with irregularity. The film encourages physicians, parents, teachers, nurses, and social workers to combine their efforts to conquer these infections. The idea that rheumatic fever can be prevented by preventing streptococcic infections is repeated over and over by means of symbolic animation. This is a very good film that would be suitable for parent groups, service clubs, public health nurses, and high school students.

Videclinic: Coronary Artery Disease: 16 mm., black and white, sound, showing time 1 hour and 47 minutes. Produced in 1955 by the Smith, Kline & French Medical Television Unit. Procurable on loan (service charge $3) from Committee on Medical Motion Pictures, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film is a Kinescope of a program that was originally produced for closed-circuit television. President Eisenhower opened the program by applauding medical advances that have lengthened the American life span but added, "If the annual toll from coronary artery disease were revealed to the American people as a casualty list from the battlefield, the effect would be one of national shock and a demand that something be done. That something *is* being done in such programs as tonight is significant and encouraging." In this film, Videclinic participants from New York, Boston, Cleveland, Chicago, Minneapolis, and New Orleans discuss the management of coronary artery disease. In New York, a panel consisting of Drs. Herrman L. Blumgart, E. Cowles Andrus, Howard B. Burchell, Howard P. Lewis, and Francis C. Wood correlate and expand the televised clinical reports from other cities. Reports on coronary disease studies in other cities are made by Drs. Paul D. White, Frederick J. Stare, Irvine H. Page, Ancel Keys, David P. Barr, Howard P. Sprague, Louis N. Katz, and George E. Burch.

Recording Oximeters and Their Applications: 16 mm., color, sound, showing time 15 minutes. Prepared by John F. Perkins Jr., M.D., and William E. Adams, M.D., University of Chicago School of Medicine. Produced in 1953 by Tressel Studio, Chicago. Procurable on loan (service charge $2) from Committee on Medical Motion Pictures, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film begins with a picture of a Van Slyke apparatus during an analysis of blood for oxygen. The narrator makes the point that, in spite of the accuracy of the apparatus, continuous data regarding blood-oxygen content are not provided. The principles of oximeters are then briefly reviewed by means of a photoelectric exposure meter and transparent containers containing red and blue dyes to simulate oxygenated and reduced blood. Oximeter earpieces are shown, and various types of recording oximeters are demonstrated in use during teaching of respiratory physiology, during various tests of pulmonary function, during an operation for valvulotomy, during an operation for pulmonic stenosis with atrial septal defect, and during postoperative oxygen therapy. The advantages of recording-type oximeters are stressed. This picture represents recent developments and has immense practical applications to a great many people. There is also a great deal of dramatic impact. The photography is excellent. It is recommended for physiologists, biochemists, chest surgeons, cardiac surgeons, specialists in internal medicine, and medical students.

V 1
195

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Studies with the Displacement, Velocity, and Acceleration Ballistocardiograph in Aortic Insufficiency. J. E. Smith, R. Rosenbaum and R. Ostrich. Am. Heart J. **48:**847-863 (Dec.) 1954 [St. Louis].

While the clinical picture of aortic insufficiency usually presents no great difficulty in diagnosis, there are many cases of mild aortic incompetence that are difficult to recognize. Smith and associates show that the acceleration ballistocardiograph provides a sensitive measure for demonstrating small aortic valvular leaks and thus may be of value to the clinician in the difficult cases. The simultaneous recording of displacement, velocity, and acceleration was obtained by using calibrated instruments. Normal standards for displacement, velocity, and acceleration ballistocardiographs found in direct ballistic measurements in 50 normal adults are presented, and the techniques for measurement of body motion approximating the single degree of freedom response are discussed. Comparisons of 10 cases of aortic insufficiency revealed that the deviations from normal are usually (1) higher amplitude on all measurements, (2) deeper velocity K waves, and (3) higher amplitude acceleration K wave, especially when measured from the base line, and usually notching of the acceleration J peak with the ratio of J to K peak over 1.3. Fourier analysis shows that the notching of the acceleration J peak previously believed to be associated with high-frequency (above 15 cycles) components of the ballistic record are actually the result of phase shift associated with lower frequency components (below 10 cycles). Methods of taking advantage of the nonlinear response characteristic of the acceleration ballistocardiograph to bring out important notch patterns are discussed.

Terminal Endocarditis in Cancer and Its Significance. G. T. Hultquist. Nord. med. **53:**307-311 (Feb. 24) 1955 (In Swedish) [Stockholm, Sweden].

Endocarditis with a characteristic morphological picture is not infrequently met with at autopsy in cases of cancer and is by many authors called terminal endocarditis. In an autopsy material of 12,000 cases from 1937 to 1954, terminal endocarditis was found in 80 cases of cancer. In most of the cases it was apparently without clinical significance. In 17 cases, however, there was a triad of clinical-pathological changes: cancer, endocarditis, and cerebral embolism with hemiplegia. The embolism may occur a fairly long time before death, and the designation terminal is therefore not always justified. So-called terminal endocarditis can occur without more direct connection with the last phases in the course of cancer, and it seems probable that it can occur at any time during the disease, but the likelihood of its occurrence increases with the growth of the cancer, spread of necrosis and ulceration with secondary infection, and the effect of the cancer on the general condition. In the series studied there are examples of grave clinical symptoms caused by terminal endocarditis, which was directly or indirectly the cause of death.

The place of publication of the periodicals appears in brackets preceding each abstract.

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Use of ACTH in the Diagnosis of Adrenal Cortical Insufficiency. D. Jenkins, P. H. Forsham, J. C. Laidlaw and others. Am. J. Med. **18:**3-14 (Jan.) 1955 [New York].

When corticotropin (ACTH) became available, it became evident that the administration of this material to subjects with intact adrenal cortical function produced a wide spectrum of metabolic changes consistent with the enhancement of all known functions of the adrenal cortex. The striking absence of these changes in patients with adrenal cortical hypofunction (Addison's disease) receiving corticotropin led to the development of standardized procedures for the evaluation of adrenal cortical function in man. This paper summarizes the clinical experience of seven years with the corticotropin test in the Peter Bent Brigham Hospital. An adequate test of adrenal cortical function requires a potent corticotropin preparation and some knowledge of the history of the commercial corticotropin preparations. The validity of the criteria of adrenal stimulation is the second important factor of the reliability of the corticotropin test. Two criteria were used in these studies: (1) an indirect index—a decrease in circulating eosinophils, selected because of the rapidity and convenience of the measurement; and (2) a direct index—a rise in the urinary excretion of adrenal steroids, selected because of a high degree of specificity of this response to adrenal cortical activation. A pronounced eosinopenia following intensive adrenal cortical activation with corticotropin is a reliable diagnostic index of intact adrenal cortical function. For proper interpretation, however, the intrinsic error of the eosinophil counting methods must be understood and the indirect nature of eosinopenia as an index must be recognized. An increase in urinary excretion of 17-hydroxycorticoids after corticotropin administration is a direct reflection of adrenal cortical activation. Attention is called to this procedure (and related methods) as a highly useful technique for the clinical laboratory. The rapid corticotropin test (four-hour eosinopenic response to a single intramuscular injection of corticotropin) may be useful as a preliminary screening procedure. It should not be relied upon as the sole diagnostic index of adrenal cortical function. Epinephrine should not be employed as a diagnostic agent in evaluating pituitary-adrenal function, since there is strong evidence that, despite the frequent occurrence of eosinopenia, epinephrine does not stimulate the pituitary-adrenal system of man. An eight-hour intravenous infusion of corticotropin produces an intense stimulation of the adrenal cortex as reflected by a marked eosinopenia (75% or greater) and a significant rise in urinary 17-hydroxycorticoid excretion (5 mg. per 24 hours or greater). These changes afford a sensitive and valid test of adrenal cortical reserve. The intramuscular or subcutaneous administration of purified corticotropin in a long-acting gelatin vehicle appears to offer an alternative method of obtaining a definitive evaluation of adrenal cortical function.

Clinical Value of the TSH Test in the Diagnosis of Thyroid Diseases. G. A. Bishopric, N. H. Garrett and W. M. Nicholson. Am. J. Med. **18:**15-19 (Jan.) 1955 [New York].

The response of the radioactive iodine uptake to thyrotropic hormone stimulation has been shown to be an accurate point of differentiation in distinguishing between primary hypothyroidism and hypothyroidism secondary to pituitary dysfunction. The usual measurements of thyroid function give low results in both, but the response to thyrotropic hormone stimulation is strikingly different. If hypothyroidism is primary, whether spontaneous or as a result of surgery or isotope therapy, there should be no response to thyrotropic hormone stimulation. The abnormal or largely absent thyroid gland is already functioning at its lower peak capacity and is presumably already under maximal thyrotropic hormone stimulation from the pituitary in the "feedback" mechanism. If hypothyroidism is secondary to pituitary deficiency, the thyroid gland is structurally and potentially functionally normal and a good response to thyrotropic hormone stimulation is expected. The authors attempted to establish the

reliability of the radioactive iodine uptake response to thyrotropic hormone stimulation as a diagnostic procedure. The change in the 24-hour radioactive iodine uptake of the thyroid gland after stimulation with a single injection of thyrotropic hormone is a reliable diagnostic aid in distinguishing between primary and secondary hypothyroidism. It is also of value in differentiation between primary hypothyroidism and euthyroidism in patients whose thyroid function has been suppressed by substitution therapy and whose clinical and laboratory picture otherwise is similar. The technique used, a single injection of thyrotropic hormone and a total of only four days' observation, seems to be at least as reliable as techniques involving multiple injections of thyrotropic hormone and much longer periods of observation. The 3-hour uptake response to thyrotropic hormone parallels the 24-hour response but does not seem to be as safe a diagnostic aid because of relatively larger experimental error. An upper limit of increase of 10 in the 24-hour percentage uptake after thyrotropic hormone and an upper limit of 15% in the total 24-hour radioactive iodine uptake after thyrotropic hormone seem to be the highest values acceptable for the diagnosis of primary dysfunction of the thyroid gland.

Evaluation of Prolonged Cortisone Therapy in Rheumatoid Arthritis: A Four-Year Study. J. J. Bunim, M. Ziff and C. McEwen. Am. J. Med. **18:**27-40 (Jan.) 1955 [New York].

The authors report observations made over a four year period on 78 patients with rheumatoid arthritis (including 9 patients with juvenile rheumatoid arthritis) who were treated with cortisone for intervals varying from a few weeks to almost four years. The patients were examined every four weeks or more frequently. After prolonged treatment with corticosteroids 23% were in remission, 28% showed major and 43% minor improvement, and 6% were not benefited. Many factors enter into response: improvement may be only apparent in some cases, and side-effects may be hazardous. Adrenal cortical steroids are very useful in properly selected cases of rheumatoid arthritis. The patients most suitable for hormone administration are those whose disease is severe, reversible, of a relatively recent development but following a rapidly progressive, relentless course. It may also be useful in patients who have not responded well to or are unable to tolerate other antirheumatic drugs. Patients who do not require larger than moderate doses of steroid for the control of their arthritis and who present no contraindications or unusual susceptibility to the side-effects of the hormone are suitable subjects for steroid therapy. Many patients can tolerate maintenance doses of cortisone for several years without their illness becoming refractory and without developing clinical symptoms of adrenal cortical insufficiency. Most of the undesirable side-effects are reversible; in fact, many disappear even during continued administration. Limitations of steroid therapy that became apparent during this study included: failure appreciably to alter or arrest the extension of the pathological processes of the disease, frequent occurrence of relapses when the drug was discontinued, and the development in some cases of serious complications or side-effects.

Effect of Cortisone in the Long-Term Treatment of Rheumatoid Arthritis: Observation of 35 Patients Over a Three-Year Period. E. C. Toone Jr. and R. Irby. Am. J. Med. **18:**41-50 (Jan.) 1955 [New York].

This report deals with 35 patients with rheumatoid arthritis in whom treatment with cortisone was started during the summer of 1950 and who remained under observation until the summer of 1953. The patients were hospitalized at the beginning of the treatment program. During hospitalization of from 10 to 14 days intensive treatment with intramuscular injections was carried out. The immediate response was gratifying in 34 cases. There was striking relief of pain, improvement in muscle stiffness, and in some instances a surprising increase in joint motion. Most patients enjoyed a mild euphoria, increase in appetite, and gain in weight and energy. The remaining patient died during the initial treatment period. The patients were advised before leaving the hospital that cortisone was not curative and that treatment would have to be continued indefinitely. They were instructed to keep in contact with their physicians so that the proper maintenance dose could be arranged. They were likewise cautioned about possible toxic reactions. At the end of one year all patients were sent a questionnaire, and at the end of two and three years, respectively, those patients who were still taking cortisone were contacted. Eleven patients were still taking the drug at the end of three years, and none of these experienced any serious adverse reactions. Of five deaths, four were probably the result of cortisone therapy. Adverse or toxic reactions sufficiently severe to require discontinuance of treatment developed in 10 cases. In two of these, it was doubtful that the cortisone was entirely responsible. Minor adverse or toxic reactions occurred often and in various forms. Many miscellaneous clinical conditions developed in this group during the cortisone treatment and were a source of apprehension and concern to both the physician and the patient. Many of these had no relationship to the treatment. Cortisone has a definite but limited use in the maintenance management of rheumatoid arthritis. It should not be used routinely but only after other measures have been adequately tried.

The Anemia of Liver Disease: Observations on Its Mechanism. J. H. Jandl. J. Clin. Invest. **34:**390-404 (March) 1955 [New York].

The frequent association of anemia with chronic liver disease provides a means of examining the role of the liver with respect to the formation and destruction of red blood cells. An understanding of the mechanism of this anemia has been retarded by the frequent appearance in afflicted patients of complicating factors such as blood loss, infection, neoplasm, and occasionally nutritional macrocytic anemia, as well as by the diversity of the actual hepatic lesions. Furthermore, the proliferative aspects of the liver and spleen in hepatic cirrhosis render it theoretically likely that, in this common form of chronic liver disease, superimposed pathological, as well as altered physiological, processes act upon the production, sustenance, and destruction of red blood cells. The pattern of red blood cell turnover in chronic liver diseases is of basic clinical and physiological interest. Twenty patients with chronic liver disease and various degrees of anemia, in whom no evidence existed of current or previous blood loss, were transferred to a special metabolic ward for study by various hematological techniques. The group included 10 men and 10 women ranging in age from 28 to 64 years. All were chronic alcoholics in whom a diagnosis of cirrhosis was made on clinical grounds. This diagnosis was verified pathologically in six patients in whom confirmatory liver biopsies were considered necessary and in three patients at autopsy. Observations were begun on the average 6 days after hospital admission and were continued for an average of 36 days. Of the 20 patients, 11 improved clinically while under observation, 4 showed no improvement, and 5 died in hepatic coma. Studies indicated that an extracorpuscular hemolytic process was present that was proportional in severity to the degree of anemia. The hemolysis appears to have consisted in local destruction of red blood cells, probably through their sequestration in the spleen. Hemoglobin production, despite persistence of the anemia, did not generally exceed two or three times the normal rate, which suggests a diminished sensitivity to anoxia. This insufficient capacity to produce hemoglobin may have been impaired further by the ingestion of alcohol. Improvement in hemoglobin levels, at least initially, may be largely a result of increased production rather than of a decrease in the rate of destruction. In four patients, folic acid deficiency was the factor limiting hematopoiesis. Observations suggested that the anemia associated with liver disease, when not a result of superimposed folic acid deficiency or of blood loss, may be moderately severe and is generally self-limited.

The Transmission of Hepatitis Virus by Routine Immunization Procedures. F. P. Ellis. J. Hyg. **53:**124-128 (March) 1955 [London, England].

There is ample evidence that any of the usual inoculation procedures introduces a risk of conveying infection from one subject to another unless a separate sterile syringe and needle are used for each inoculation. During 1943 at a naval establishment, 30 out of 81 men admitted with infectious hepatitis developed the illness within two months of the dates on which they were inoculated against the typhoid and paratyphoid groups

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of infections. The Admiralty requested all naval medical officers in charge of patients to report certain details for each person in the Royal Navy who acquired nonsurgical jaundice between June 1, 1944, and Jan. 9, 1948. Altogether 4,105 returns were received for men and women serving in the Royal Navy during these years who had contracted nonsurgical jaundice. Of these, 716 returns contained recorded dates of onset of illness and the dates of either inoculation, or vaccination, or of both and showed that within the 12 months preceding illness the person in question had not experienced any other form of parenteral immunization or therapy such as arsenotherapy or blood transfusion and was not a known contact. The numbers who were inoculated against typhoid between the 11th and 40th days preceding the onset of illness were significantly greater than the numbers to be expected if there was no relationship between these two events. During 1945 the observed numbers were also greater than the expected numbers when 41-70 days intervened between inoculation and the illness. As the incubation period is said to lie between 15 and 40 days for virus A of infectious hepatitis and between 60 and 160 days for virus B of serum or inoculation hepatitis, it is clear that, if some of those who developed the illness within 10 to 40 days of being inoculated against typhoid were infected by this injection, the virus infecting them would have been virus A. It is quite reasonable to suppose that virus A, as well as virus B, may be transmitted by injections, for both kinds of disease have been produced experimentally by inoculation of blood; indeed, the two viruses may be close variants of a single virus. Since it seems evident that T. A. B. inoculations carry a small risk of producing hepatitis, the technique of inoculation should be designed to insure that such infections do not occur. Attention is drawn to the advice of the World Health Organization Expert Committee on Hepatitis, which embodies details of the precautions that ought to be taken.

Acquired Agammaglobulinemia with Hypersplenism: A Case Report. R. J. Rohn, R. H. Behnke and W. H. Bond. Am. J. M. Sc. **229**:406-412 (April) 1955 [Philadelphia].

A case of acquired agammaglobulinemia with complicating hypersplenic pancytopenia is described in a 29-year-old man with a seven month history of progressive weight loss of 53 lb. (24 kg.), weakness, cough, hemoptysis, and occasional cramping periumbilical pains. The patient had been in good health until the age of 19 years, but in the following years he had repeated attacks of diarrhea. The patient's spleen extended 2 cm. below the level of the umbilicus. There was a generalized lymphadenopathy with the nodes firm and rubbery in consistency. Lymph node biopsy showed fibrosis and reticulum cell hyperplasia with diminished lymphocytes. Serum and plasma protein values as determined with Tiselius' electrophoretic apparatus showed an absence of gamma globulin in both serum and plasma. Hematological studies revealed a persistent severe pancytopenia. Splenectomy was performed and was followed by an excellent hematological response with a prompt rise in red blood cells, platelets, and leukocytes. Because of the absence of gamma globulin, temperature of 100 F (37.8 C), and recurrent infections, the patient was given pooled gamma globulin in doses varying from 10 to 30 cc. With this therapy his strength increased, minor cutaneous infections disappeared, and there was less rise of temperature. While gamma globulin activity could be demonstrated on paper electrophoresis for 30 or more days after injection of a single dose, the patient began to show clinical deterioration in 14 to 21 days after such injection. The available data would suggest that the patient's agammaglobulinemia was of the acquired type, since it would seem unlikely that he would have been in good health until the age of 19 years without significant gamma globulin levels. Study of the electrophoretic patterns and hemograms of the parents and siblings of the patient showed no deviation from the normal patterns. The patient's hypersplenism apparently resulted from the compensatory hyperplasia and hyperfunctioning of the phagocytic elements of the reticuloendothelial system, since study of the splenic tissue, in addition to demonstrable congestion, showed pronounced increase in highly phagocytic clasmatocytes containing great numbers of phagocytized erythrocytes, platelets, and leukocytes. Alterations in the electrophoretic pattern and their response to injection of varying doses of gamma globulin suggested that adults with agammaglobulinemia might require an intramuscular injection of approximately 20 cc. of gamma globulin every 14 to 21 days for maximum protection.

Nocardiosis: Discussion of Two Cases with Emphasis on Diagnostic Features. M. P. Clapp and M. J. Williams. Texas Rep. Biol. & Med. **13**:11-22 (No. 1) 1955 [Galveston, Texas].

Two fatal cases of nocardiosis are described, both of which occurred in young men in their late 20's. The first patient consulted his physician on account of productive cough and intermittent fever 15 months prior to his hospitalization. Clinical and radiological studies seemed to indicate a fungus infection of the lungs. Laboratory investigations failed to reveal the etiological agent. He was treated with iodides and various antibiotics, with no amelioration of his symptoms. Shortly before admission, severe persistent headaches developed. At spinal puncture the cerebrospinal fluid escaped under increased pressure. An electroencephalogram indicated a focal abnormality in the left temporal lobe. The patient's general condition deteriorated progressively, with increasing mental confusion and terminal coma. Autopsy revealed a greyish-yellow zone of induration at the hilus of the left lung, with central cavitation. There was a large abscess in the left temporal lobe that had ruptured into the inferior horn of the lateral ventricle. The pus was light green in color. Nocardia asteroides was cultured from the pus. No significant organisms could be recovered from the pulmonary lesion. After death sputum cultures also yielded N. asteroides. On the basis of these postmortem findings, the disorder was diagnosed as nocardial brain abscess probably secondary to pulmonary nocardiosis. The clinical course of the second patient was similar to that of the first. Autopsy revealed a severe patchy suppurative pneumonitis involving both lungs. In the right retroperitoneal space was a tremendous abscess extending from the diaphragm to the pelvis. There was thrombophlebitis of the inferior vena cava. Examination of smears of pus from the retroperitoneal abscess demonstrated gram-positive and occasionally acid-fast filamentous organisms. N. asteroides was recovered in cultures of blood from the right atrium, tissue from both lungs, and pus from the retroperitoneal abscess. Only about 65 cases of nocardiosis have been reported, but, since in many of these cases the diagnosis was established only after death by culture and by histological study of autopsy material, the incidence may be greater than the small number of reported cases seems to indicate. As this disease in its earlier stages is amenable to therapy, it is suggested that nocardiosis should be borne in mind when cases of chronic unexplained infection are under consideration.

Hydrocortisone in Lesions of Soft Tissue. E. J. Crisp and P. H. Kendall. Lancet **1**:476-479 (March 5) 1955 [London, England].

A series of 209 patients treated with 350 injections of hydrocortisone represents about a year's trial of this form of treatment for the several types of soft-tissue "rheumatism" commonly observed in general practice. Tennis elbow (lateral epicondylitis) and golfer's elbow (medial epicondylitis), planta fasciitis, olecranon and prepatellar bursitis, and the various acute and chronic soft-tissue lesions of the shoulder joint are all common conditions in which trauma is supposedly followed by low-grade nonspecific inflammation. The essential lesion is in doubt, but the general picture consists of local pain, tenderness, and edema of soft tissues, with formation of adhesions and limitation of movement. A similar response to trauma is seen in the synovial membranes of joints in which local inflammation, shown by acute effusion, follows the injury and can be considered to be a reaction of the soft tissues to it. Although these conditions have a natural history of spontaneous recovery, the period of painful incapacity is often long, and the patient often receives much unavailing physiotherapy. Hydrocortisone acetate was used throughout the series, and with very few exceptions the dose was 25 mg. in a 1 ml. suspension. The suspension was mixed with hyaluronidase, 1,000 units dissolved in 2 to 5 ml. of 2% procaine hydrochloride. The advantages of this mixture are fourfold: 1. It provides a more manageable quantity of solution. 2. Its local anesthetic action confirms accurate localization. 3. It gives the patient immediate relief. 4. The

hyaluronidase insures the greatest local dispersion of the suspension. One hundred seventy-six of the 209 patients obtained complete or partial relief from symptoms, and 33 did not improve. Recurrences were noted in 20 cases (about 10%), most of them within three months of treatment. Hydrocortisone by its "anti-inflammatory" action, which has not yet been explained, appears to be of great value in treating acute nonspecific lesions of soft tissues; its efficiency is greatest in the early acute cases, where inflammation is presumably at its peak, and least in cases of long standing, in which the inflammation has probably subsided and fibrosis is prominent.

Contribution to the Study of the Effect of Prolonged Treatment with Antibiotics Combined with Isoniazid on the Cicatrization of Cavities. A. Bernou and J. Tricoire. Rev. tuberc. **18:**1173-1180 (No. 12) 1954 (In French) [Paris, France].

Prolonged treatment with antibiotics and chemotherapy increases the number of cures of cavitary tuberculosis obtainable without collapse therapy. Comparison of two series of patients, one treated by bed rest alone and the other by bed rest and a combination of streptomycin or *p*-aminosalicylic acid with isoniazid or gluconiazid for an average of from seven to eight months with no interruptions other than those required for bacteriological evaluation, shows that the number of large filled cavities was reduced from 27 (14.6% of 185 patients in series 1) to 2 (1.2% of 161 patients in series 2) when bed rest was supplemented by antibiotics and chemotherapy. An accompanying increase in the number of small cicatrized cavities and bullous or sclerocystic cavities seems to show that cavity walls can be effectively cleansed when isoniazid is used. Bullous or sclerocystic cavities, of course, cannot all be said to be entirely free of casein, even when the patient's sputum remains persistently negative, but perfect cleansing has been found on examination in a sufficient number of lung specimens to show that it may occur; in other cases, the durability of the cure has been shown by a follow-up of the patient for from seven to eight years. Bullous cavities may also undergo contraction and close after having remained stationary for some time. Repeated studies have shown that cavities may become closed without previous closing of the drainage bronchus and even without its closing at all; whether the number of closures without obstruction of the bronchocavitary orifice has really increased since the use of antibiotics and chemotherapy has still to be determined. Relapses, in patients treated with rest alone, occurred in only 1.05% of 95 small cavities, whereas in 88 medium and large cavities the proportion of relapses was 29.6% for those from 1 to 8 cm. in average diameter and 6.5% for those with an average diameter of from 3 to 10 mm. This seems to show that the increase in the number of small cicatrized cavities brought about by the use of antibiotics and chemotherapy is a favorable development so far as prognosis is concerned.

Comparison of the Radiological, Clinical, and Bacteriological Results of Continuous Treatment of Ulceronodular Tuberculosis for 10 Months with Combinations of Isoniazid–p-Aminosalicylic Acid and Isoniazid-Streptomycin. P. Véran. Rev. tuberc. **18:** 1153-1172 (No. 12) 1954 (In French) [Paris, France].

The therapeutic effect of isoniazid and *p*-aminosalicylic acid given in combination to one group of patients with ulceronodular tuberculosis was compared with that of a combination of isoniazid and streptomycin given to another group that was as much like the first as possible. Most of the patients had moderate to very extensive disease, according to the Trudeau Society classification; all had positive sputum with bacilli sensitive, before treatment, to isoniazid and streptomycin; and more than half in each group had fever at the outset. Some patients left each group during the 10 months of the study, so that the isoniazid–*p*-aminosalicylic acid group was reduced from 78 patients at the two-months' mark to 50 in the 10th month, while the number of patients in the isoniazid-streptomycin group dropped from 87 at the end of the second month to 51 at the end of the 10th. The daily dose of isoniazid was 5 mg. per kilogram of body weight, combined either with dihydrostreptomycin in doses of 1 gm. every third day or with *p*-aminosalicylic acid in doses of 15 gm. a day. The treatment was interrupted for six days every two months to permit radiological and laboratory evaluation of the patient's status. The effect of the two combinations on the general and functional signs was identical, except for a more rapid drying up of expectoration with isoniazid and streptomycin than with isoniazid and *p*-aminosalicylic acid. The radiological results, too, were very much the same for both combinations in recent lesions; in old lesions, however, isoniazid-streptomycin was constantly and significantly the more effective. There were some patients in each group in whom bacilli were persistently present; in these, the bacilli remained generally sensitive to streptomycin but varied in their sensitivity to isoniazid, to which they were sometimes sensitive and sometimes resistant. The prognosis for these patients was poor; their pulmonary lesions became stationary and they usually failed to show any improvement. Isoniazid resistance developed slowly but progressed similarly with both combinations; it was not accompanied by streptomycin resistance, which was rarely found when isoniazid and streptomycin were combined. Patients in whom isoniazid resistance became strong remained generally unimproved. These findings seem to show a certain parallelism between the results of the two combinations as they are disclosed by radiological, clinical, and bacteriological study.

Cortisone Treatment of Boeck's Sarcoid of the Lungs. E. Sommer. Schweiz. med. Wchnschr. **85:**215-222 (March 5) 1955 (In German) [Basel, Switzerland].

There are no indications for a routine treatment with cortisone of the pulmonary forms of Boeck's sarcoid. The diagnosis of Boeck's sarcoid must be established in every case before cortisone treatment is instituted; activity, progress, and phases of the disease must be ascertained and, if possible, verified by microscopic examination of biopsy specimens. An attempt at treatment should be made primarily in patients with relatively recent and definitively progressive forms of the disease possibly still in stage 1, i. e., that of pregranulomatosis or in stage 2, i. e., that of early, pure granulomatosis. Early therapy is aimed at the prevention or at least at the retardation of the progressive development of the disease into stage 3, i. e., that of fibrosis, rather than at treatment of the early forms of the disease as such. The basis required for combination of cortisone with streptomycin is still lacking. Continued careful observation of the patient is important, and, consequently, his hospitalization is indispensable, in order to discontinue cortisone and to substitute streptomycin for it in cases in which tuberculosis becomes associated with Boeck's sarcoid. The hilar lymphoma type of pulmonary sarcoidosis in contrast to the parenchymatous types does not require specific treatment, since spontaneous healing may occur in most of the cases, although frequently after many months only. The hilar lymphoma type responds poorly to cortisone; cortisone therapy should be considered only in cases in which in addition to the hilar lymphoma the parenchyma is also affected by the disease process, provided there are signs of progression or of activity. The dosage of cortisone must be determined according to the individual case and depending on the patient's response. The dose should be as low as possible, but initial daily doses of 100 to 150 mg. are necessary, and maintenance doses may vary between 50 and 75 mg. daily. Withdrawal of the drug should be carried out gradually, with careful control of the patient; occasionally administration of corticotropin for short periods may be useful in order to stimulate the adrenal cortex. As soon as the onset of fibrosis is suspected in the presence of compensatory pulmonary emphysema and reduced vital capacity, treatment with cortisone is strictly contraindicated, and that despite the possibility of temporary subjective improvement. In doubtful cases biopsy of the lung must be done to ascertain the exact stage of the disease. Three cases of Boeck's sarcoid with progressive pulmonary fibrosis are described in three women in the age groups between 29 and 40 years who were treated with cortisone between 1952 and 1953 when the indications and contraindications to this treatment were not yet established. Roentgenologic improvement did not occur in any of the three patients, while subjective improvement was "dramatic" but temporary only. Withdrawal of the drug was characterized by signs of depression in all three patients, two of whom were worse than before the institution of the treatment; in the third patient vital capacity increased slightly from 2,350 cc. to 2,700 cc. in the course of the treat-

ment, and it was maintained at this level for nine months. Her case was the least advanced, and one might have assumed that there still remained a tendency to spontaneous healing. The increase in gamma globulin in all three patients, however, suggested that despite cortisone treatment all three patients had become worse.

SURGERY

Management of Hemorrhage from Esophageal Varices. A. Y. Wilcox Jr. J. Florida M. A. **41:**721-725 (March) 1955 [Jacksonville, Fla.].

Thirty-four patients with hemorrhage from esophageal varices were observed by Wilcox between 1950 and 1953. He shows two ways in which the esophageal and gastric veins may become dilated owing to portal hypertension. The age of the patient is of help in the diagnosis, most patients having their first hemorrhage from esophageal varices between the fourth and sixth decades of life. The physician should attempt to elicit a history of previous hepatitis, jaundice, cirrhosis, splenomegaly, pancreatitis, alcoholism, varices, or peptic ulcer. Around 16% of patients with cirrhosis have an associated peptic ulcer. Emesis of large amounts of bright red blood, signs of shock, and enlargement of the liver and spleen are of diagnostic significance. In all of the cases reviewed here the presence of esophageal and/or gastric varices was proved by esophagram, esophagoscopy, at operation, or at postmortem examination. In 28 of the 34 cases the lesion was bleeding when the patient was admitted to the hospital or bled during the period of hospitalization, or a massive hemorrhage occurred as a terminal event. Blood transfusions should be used freely in the treatment. Rising pulse rate, falling blood pressure, falling hematocrit reading and red blood cell count are guides for the use of blood. The author administers 500 cc. of blood for each 300,000 red cell deficit in the blood count. If the prothrombin time is prolonged, large doses of vitamin K should be given. In addition to these supportive measures Wilcox uses the Sengstaken tube to produce a tamponade effect in the lower part of the esophagus and cardia of the stomach. This tube, a three lumen one, with a gastric and esophageal balloon and a gastric tube, is superior to the two lumen tube, first because the third lumen permits the aspiration of the gastric contents to determine absence of or continuation of bleeding, and, secondly, nutritious liquids as well as water can be administered through the gastric tube, and, if necessary, barium can be given for roentgen study. In the 28 patients who bled, esophageal and gastric tamponade was tried in 12, of whom 4 died and 8 survived the hemorrhage. Of the 16 in whom the tube was not used, one survived a mild hemorrhage and 15 died. The use of esophageal and gastric tamponade by means of the three lumen, two balloon tube helps tide the patient over a critical period and allows time for preparation for surgical treatment. Of the eight who survived the hemorrhage with the aid of the tube, three are still living following surgery for portal hypertension; one died 10 days after a portal caval shunt, one was sent to another hospital but died before operation was performed, two others died following operations, and one died on his second admission before therapy was started.

Ulcerative Colitis: Follow-Up Studies. F. C. Wheelock and R. Warren. New England J. Med. **252:**421-425 (March 17) 1955 [Boston].

A follow-up study of 483 patients with ulcerative colitis seen at the Massachusetts General Hospital before 1943 is reported. Three hundred forty-three patients were followed for 10 or more years or to death; 232 patients (48%) were eventually operated on for ulcerative colitis. Over half the patients who were operated on or died without operation did so within the first three years. Most patients living after 10 years were under control whether treated with operation or without. The fact that over 60% of the patients were finally operated on or died of the disease is an expression of the inadequacy of nonoperative therapy during the early part of the period under study. Methods of nonoperative therapy have improved since then to the point where they have actually made the major contribution to a lower mortality, both operative and nonoperative; they have also prolonged the interval between onset of the disease and required surgical treatment. Carcinoma of the colon developed in 31 patients, 24 of whom were dead and 7 alive (2 for more than five years) after operation. Even patients with mild cases of ulcerative colitis seem to be more prone to contract cancer than a normal person, as shown by the fact that cancer developed in patients with ulcerative colitis of long standing who were never sick enough to be hospitalized. Also, there were four cases of carcinoma in colons of patients whose barium enema examinations during the initial examination showed only the most minimal signs of spasm or diminished haustral markings. During the later period of this study the prevalence of carcinoma of the colon as a complication of ulcerative colitis has risen; survival of more patients has produced more cancer without avoiding ileostomy. The finding of 26 cases of small intestine obstruction after colectomy or ileostomy seems formidable. Important lessons have been learned that will lower the frequency of this complication and the mortality from it. At the time of colectomy great care must be taken to reperitonealize all rough surfaces and to close the gutter lateral to the ileostomy. This is done with a continuous cotton suture, the anterior, lateral, and posterior peritoneum, together with the mesentery of the ileum, being used. No such closure of the lateral gutter is done when ileostomy alone is performed, for the cecum fills in this area. Once obstruction is diagnosed, immediate operation is indicated. Small amounts of ileostomy discharge do not rule out obstruction. It is of value to know that late obstruction is rare and that the patient can be assured that, though complications do occur, eventual freedom from them is to be expected. In view of the susceptibility of patients with chronic ulcerative colitis to cancer, anyone with this diagnosis established at the end of three years of treatment should be urged to have colectomy with ileostomy. Patients who prefer the risk of cancer to the handicap of ileostomy should receive barium-enema and sigmoidoscopic examinations twice a year as long as the colon remains and regardless of symptoms.

The Relief of Resistant Edema by Utilization of a Sump Phenomenon. F. R. Schemm and A. A. Camara. Circulation **11:**411-421 (March) 1955 [New York].

Schemm and Camara point out that, despite the more efficacious control of edema brought about by a better understanding of electrolyte metabolism, the application of acid-base and water balance principles and the development of effective diuretics, there remain certain groups of cardiac and nephrotic patients whose edema remains absolutely or relatively intractable. In a group of such patients they observed what they refer to as the "sump" phenomenon. The patients included 10 with heart disease, 3 with nephritis, and one with diabetes, each of whom had hydrothorax and/or ascites. Relief of edema was achieved by repeated aspirations of fluid from the pleural or peritoneal space, which acted like a "low-pressure" area into which edema fluid seeped after each aspiration. In some of these patients, the usual diuretic measures, that is, meticulous attention to the regimen and repeated doses of mercurial diuretics, achieved no relief of edema, but such relief could be attained through repeated aspirations of fluid from the sump. In the other cases, utilization of the sump for the mechanical removal of fluid proved of value in hastening the relief of edema and shortening the period of hospitalization. In such patients, recurrence of peripheral edema is preceded by reaccumulation of fluid in the sump, and the appearance of edema can be forestalled by repeated tapping. The weight of the patient and the urinary excretion were determined daily. The chloride, sodium, and potassium contents were ascertained in the urine, and analyses for the same electrolytes were carried out on fluid aspirated from the sump each time. The morning following admission, blood specimens were obtained in the fasting state for initial blood chemistry. The chemical determinations included sodium, potassium, chloride, carbon dioxide-combining power, blood urea nitrogen, and serum proteins. The same analyses were obtained at appropriate intervals and at the end of treatment. Observations on these patients showed that the utilization of the sump phenomenon can be of tremendous help in the management of patients with intractable edema. In these cases, the stimuli directing the renal tubules to conserve sodium and water

(desoxycorticosterone-like and antidiuretic hormones) are presumably so intense as to make elimination of excess body sodium and water via the kidney impossible. Accordingly, to afford relief of edema in such cases, the kidneys have to be bypassed. From 27 to 99% of the sodium and water eliminated, to achieve a dry weight, was removed mechanically, rather than coaxed out via reluctant kidneys. In some instances dry weight was achieved with a weight loss that corresponded very closely to the weight of the aspirated fluid. In the intervals between aspirations, the signs of fluid in the chest or abdomen increased as the signs of peripheral edema decreased without any change in total body weight. The fluid of the interstitial space and of the untapped space appeared to seep readily into the sump from which the fluid had just been removed. In most instances after dry weight was reached, the usual regimen, which had been in force from the beginning but had proved ineffective, was effective in preventing reaccumulation of fluid. In some instances, it was observed that, in order to anticipate or prevent a recurrence of peripheral edema and either hydrothorax or ascites, it was necessary to aspirate the sump at intervals for some months. Failure to do so after 500 to 1,500 ml. had collected in the sump was followed by the reappearance of generalized edema, suggesting that seepage from the sump was occurring in the opposite direction.

Massive Transfusion in the Severely Wounded: Report of a Patient Receiving 23,350 C.C. of Blood in the First Twenty-Four Hours. C. P. Artz, Y. Sako and A. W. Bronwell. Surgery **37:**469-472 (March) 1955 [St. Louis].

The patient was a 22-year-old airman, who was injured by mortar shell fragments in June, 1953. He sustained a penetrating wound of the right upper quadrant of the abdomen and a perforating wound of the left hip and right leg. During exploration of the abdomen, a 7 in. through-and-through tear of the liver was found. Bleeding from this source was controlled with absorbable gelatin sponge (Gelfoam) and absorbable surgical sutures. The patient received a total of 23,350 cc. of type O, low titer blood, or 46 pt., 7 pt. of which were freshly drawn blood, and 2,600 cc. of 5% glucose in water within 24 hours following injury. By the 37th postoperative day, he was walking about and felt well. This case emphasizes the value of replacement of blood loss with whole blood after injury.

Median-Nerve Palsy Associated with Acute Infections of the Hand. D. Bailey and J. F. B. Carter. Lancet **1:**530-532 (March 12) 1955 [London, England].

Bailey and Carter describe the histories of two women, aged 58 and 53, respectively, in whom median nerve palsy resulted from acute pyogenic infection of the hand. The first women had cut her right thumb on a broken milk bottle; the second had pricked her right thumb on a thorn while pruning rose trees. The early symptoms and the effect on the median nerve were much alike and differed only in the time of onset. The findings at operation were different, but possibly these represent two stages of the same disease process, for the second patient was operated on shortly after the original injury, whereas the first patient was operated on after an interval of four weeks. This difference in the time of operation appears to have had little effect on the rate of recovery of the median nerve. It seems likely that in both cases infection of the sheath of flexor pollicis longus resulted from a penetrating wound of the thumb, although in neither case was there unequivocal evidence of acute tencsynovitis of this sheath. Judging from the rapid onset of flexion of the fingers with extreme pain on attempted extension, it would appear that infection spread from the radial bursa to the ulnar bursa surrounding the tendons of the deep and superficial flexors of the fingers. In both cases antibiotics were administered early, and probably this was responsible for the prevention of an overwhelming infection in both cases. The authors suggest that interference with the function of the median nerve resulted from compression by inflammatory exudate in the radial and ulnar bursae deep to the flexor retinaculum, causing ischemia of the nerve. An alternative explanation is that the signs were produced by spread of infection to the nerve itself, with or without thrombosis of the arterial supply of the nerve. The authors explain why they prefer the hypothesis of compression ischemia. They suggest that any case of acute infection of the hand complicated by signs of interference with the function of the median nerve should be treated by division of the transverse carpal ligament. This division should be done early, before the nerve has been irreversibly damaged; and it should be complete, to provide effective decompression. Complete division can be safely attained only through an extensive skin incision. In neither of these two cases did any disability result from division of the carpal ligament, and in neither case was there any difficulty in obtaining healing by first intention and an inconspicuous scar.

The Effects of Air Conditioning on Operating Room Air Contamination. C. R. Edwards, C. W. McGrady Jr. and A. M. Funk. Am. Surgeon **21:**189-194 (March) 1955 [Atlanta, Ga.].

Bacterial counts were taken in four operating rooms before and after the installation of force draft air-conditioning units. In May and June of 1954 cultures were taken on open Petri dishes of nutrient agar exposed for 30 minutes both in the morning and in the afternoon. The height of the dishes from the floor varied from 28 to 72 in. The exposed dishes then were incubated for 72 hours before the colonies were counted and identified. The air for the operating rooms at this time came through open windows in the steam rooms and through the open doors. Shortly after the control studies were made, work was begun on sealing the windows and installing the air-conditioning units. Following the completion of this work, the conditions in the rooms were allowed to stabilize for two weeks before the second set of studies was undertaken. Before air conditioning essentially the same type of air contamination was found as that which had been ascertained by Hart in extensive studies of more than 40 operating rooms over the country. Afternoon counts were on the whole much higher than the morning counts. When the afternoon counts were lower, it was noted that all operations had ended for the day in that particular room, or the room was in the process of being cleaned between operations. In the control studies the authors found that room A was the most contaminated, as had been expected, because of its location close to the offices and to the rest of the hospital. The relationship of the street to room D seemed to have no effect on the bacterial contamination. All operating rooms have 22 ft. ceilings with a 6 ft. tile border extending up from the floor. The floors are washed between operations with Roccal (10% high molecular alkyl dimethyl benzol ammonium chloride and 90% inert substance), and each night the tables and shelves are cleaned with Roccal. After dirty cases, everything is cleaned as described. For the control period the mean number of counts per position was 128, with a standard deviation of 92; for the post-conditioning period, the mean number of counts per position was 68, with a standard deviation of 54. An attempt was made to correlate the numbers of colonies with the height of the Petri dish from the floor. Cultures between 52 in. and 72 in. were compared with cultures from 28 in. to 52 in. above the floor. The mean at the two levels differed by only two to four colonies; this difference is not significant.

Results of Surgical Treatment of Primary Carcinoma of the Lung. J. E. Macmanus, J. R. Paine, R. Anthone and A. A. Anderson. Surgery **37:**560-566 (April) 1955 [St. Louis].

One hundred ninety-nine exploratory thoracotomies for cytologically established carcinoma of the lung were performed at the Buffalo General Hospital and the Roswell Park Memorial Institute from January, 1947, to December, 1953. There was a remarkable similarity in the statistics obtained from these two institutions, both of which serve the western part of New York state. The preoperative diagnosis was often made on x-ray evidence and clinical symptoms alone. Only 48 to 52% of the patients had positive histological or cytological diagnoses preoperatively. The resectability rate for the combined series was 53%. The over-all operative mortality for exploratory thoracotomy without resection was 2.2%. For the operation of pneumonectomy the combined operative mortality was 14%. No operative deaths occurred after lobectomy. The three year survival rate for those patients leaving the hospital alive between 1947 and 1950 after extirpation of their carcinoma was 22%. Neither of the two institutions has noted any increase in the

resectability rate during the past few years. Delay in early diagnosis remains a great obstacle to clinical progress. Whether or not radical resection will increase eventual survival times cannot be calculated at present. The authors' experience has been that it increases the morbidity of pneumonectomy.

Excisional Surgery in Pulmonary Tuberculosis. F. F. Amoruso. Canad. M. A. J. **72:**426-436 (March 15) 1955 [Toronto].

An attempt was made to determine the proper place of excisional surgery in the treatment of tuberculosis of the lungs on the basis of a series of 135 patients who underwent the same number of resections. One death occurred in this series; it was due to pulmonary embolism. No late deaths were reported in a follow-up that lasted for from 3 to 24 months. The total rate of complications was 8.1%. Of the 135 operations performed, 26 were pneumonectomies, 61 lobectomies, and 48 segmental resections. The author is of the opinion that well-planned chemotherapy and bed rest constitute the basic treatment of pulmonary tuberculosis, but excisional surgery, performed on certain indications, has a definite place in this treatment. The results obtained with the excisional procedures compare favorably with those of thoracoplasty and collapse therapy. The author selects his patients for resection according to four criteria: (1) if chemotherapy and rest, sufficiently prolonged (eight months at the very least), fail to close the cavitary lesion; (2) if this same treatment controls the disease up to the "target point" (cavity closure, negative sputum, and stable x-rays), but large residual necrotic areas are evident on radiographs; (3) if patients either represent the failure of collapse measures or show large areas of anatomic and functional destruction of lobes or lungs (gross bronchiectasis and empyema are included in this group); and (4) if diagnosis cannot be proved, suspicion of tuberculosis remains, and biopsy is necessary. In the author's experience, the mortality encountered in segmental resection for removal of small dense lesions has been nil and the few complications have been insignificant. From the point of view of risk, it is felt that the author's present program of resectional therapy in pulmonary tuberculosis is justified and the surgical attack on residual necrotic foci should be continued. If resection does not cause any more risk than appendectomy, the destroyed areas of the lung should be removed containing viable or questionably viable bacilli that are definitely known to be tubercle bacilli. The author saw one case of spread of disease by tubercle bacilli that were nonviable on culture and guinea-pig inoculation.

Cancer of Breast: Attempt at New Endocrinological Treatment Combination. R. N. Meyer. Nord. med. **53:**186-189 (Feb. 3) 1955 (In Norwegian) [Stockholm, Sweden].

The best results of hormonal treatment in cancer of the breast have been obtained by combined castration and bilateral adrenalectomy. During the past year suppression of the adrenocortical function by continuous cortisone administration instead of adrenalectomy has been tried in Aker Hospital in eight cases. The preliminary results have been encouraging. Undesirable side-effects were not seen. Surgical castration is advocated, as irradiation of the ovaries gives a later and less certain effect, and the intention is henceforth to perform surgical castration at once if there is no contraindication. The patient receives about 50 mg. cortisone daily by mouth, which corresponds to the daily basal need of the organism for glucocorticoids. With this dosage the hypophyseal production of corticotropin (ACTH) is believed to be suppressed so effectively that the adrenocortical production of androgens and glucocorticoids and their by-products is very small. It is hoped that the combined castration and cortisone therapy will prove as effective as combined castration and radical adrenalectomy, and the method might be more effective in those cases where adrenalectomy does not become radical because of accessory adrenocortical tissue, which can be expected in a number of cases. Endocrinological treatment of cancer of the breast can affect only the cancer forms that in their growth depend on certain hormonal stimuli. No control can be looked for in the more malignant cancer forms, where the cells no longer depend on such stimuli. If effective cancerostatic action can be achieved by endocrinological treatment, more enthusiastic surgical and roentgen treatment of metastases will be justified.

Carcinoma of Male Breast. P. L. M. Pasi and A. di Pietro. Rev. Asoc. méd. argent. **68:**536-538 (Nov.) 1954 (In Spanish) [Buenos Aires, Argentina].

The subject of this report is a man 60 years old who suffered with moderate insufficiency of the liver of familiar character and of moderate chronic uremia. The patient observed a small painless tumor on the left breast in October, 1953. His sister and an aunt had died from cancer of the breast. He reported for consultation in November and again in December, 1953. Only a clinical examination was made on both occasions but not a diagnosis. The patient reported for consultation to the authors of this article in February, 1954. There were no regional adenopathies. The roentgen examination did not show pulmonary or bone metastases. A biopsy of the tumor, made in February, 1954, showed scirrhous carcinoma of the first clinical and histological type of Steinthal classification. The operation consisted of radical mastectomy. The cancer had not as yet invaded the regional muscular tissues and lymph nodes. Scirrhous carcinoma of the breast is very malignant, especially in men. Its course is very rapid unless an early diagnosis and early radical operation are made. The diagnosis should be made by biopsy and followed by the operation.

Late Results of Inferior Vena Cava Ligation. R. F. Bowers and S. M. Leb. Surgery **37:**622-628 (April) 1955 [St. Louis].

Ligation of the inferior vena cava can be a lifesaving procedure when thrombosis is located in the pelvis as well as in the legs. Superficial femoral ligation will not safely prevent fatal outcome in the pelvic cases. The operation is technically easy, safe, fast, and definite in preventing pulmonary emboli from thrombus formation in the pelvis and extremities. Mortality from this procedure in experienced hands is largely associated with the lethal capacity of the condition for which ligation is performed. It cannot be used safely when conditions of the abdomen in the nature of intestinal obstruction or peritonitis coexist with phlebothrombosis. Extreme obesity adds greatly to the difficulty of the operation. However, the contraindications are not great in number, and vena cava ligation would be an acceptable procedure if the legs suffered no serious ill-effects after the ligation. Thirty-three patients underwent this procedure and are reported on; follow-up ranges from one to seven years in 25 patients. There were five deaths, a mortality of 15.2%. Four deaths were due to the disease process and one to a technical error. Besides presumably preventing fatal emboli, vena cava ligation in this series of patients was satisfactorily used prophylactically, prevented extension of ascending phlebitis, corrected one case of thrombophlebitis cerulea dolens, and saved three patients from certain major amputation. The undesirable sequelae, occurring in about two-thirds of the patients operated on, were edema, ulceration, leg pain, weakness, and occasional gangrene formation. Improvement of the thrombophlebitic condition was noted in the involved leg, but the normal leg became involved with thrombophlebitis at an alarming rate. Preoperative bilateral disease responds with less sequelae than the unilateral. Postoperative care is important. Anticoagulant therapy and elastic bandage offer the most help. Moderate walking and elevation of the feet while sleeping are also of value in this regard. Freedom from the sequelae is not necessarily noted in patients who obey all postoperative instruction. Lumbar sympathectomy is not of benefit to the patient at the time of ligation but is definitely valuable in 50% of cases at a later time, when the circulatory deficient changes are at considerable height. Any increase in edema, ulceration, leg pain, or weakness after the ligation results from the operation and not from the disease process itself.

Acute Gastric Ulcer. F. W. Taylor and D. C. Strange. Surgery **37:**536-541 (April) 1955 [St. Louis].

Primary acute gastric ulcer is a distinct clinical entity, the literature on which is inadequate. The immediate dangers of acute gastric ulcer are quite different from those of chronic gastric ulcer and demand immediate operation. Histories in this condition are brief and obscure, and diagnosis is extremely difficult. The authors report on eight proved cases of acute ulcer. Their experience has been that acute gastric ulcers in which

there is massive bleeding occur in that highly vascular part of the stomach, high on the lesser curvature; these do not perforate. Those acute gastric ulcers that do perforate may occur at any site. They do not bleed and resemble in all respects the prepyloric and duodenal perforating ulcer. In primary acute gastric ulcer, the ulceration is quite small; the authors have never seen one larger than 1 cm. in diameter. These ulcers are often hidden in the folds and rugae of the gastric mucosa so that they may be overlooked at operation.

Meckel's Diverticulum with Special Reference to Symptom of Bleeding. S. Borgström and C.-A. Ekman. Nord. med. **53:**263-265 (Feb. 17) 1955 (In Swedish) [Stockholm, Sweden].

Direct roentgenologic demonstration of a Meckel's diverticulum is seldom possible. The diagnosis is an exclusion diagnosis and is therefore uncertain. Acute cases with ileus, perforation, and acute diverticulitis point to immediate surgical intervention. The more chronic cases with relatively mild abdominal pain and intestinal hemorrhages of not alarming kind are probably often misinterpreted. In cases with intestinal hemorrhage, perhaps associated with abdominal pain, in which thorough examination fails to establish the cause of the bleeding, laparotomy is advised on suspicion that the cause of the bleeding may be a Meckel's diverticulum. In the two cases reported of operative removal of a Meckel's diverticulum, repeated intestinal hemorrhages were the cardinal symptom. In one case heterotopic gastric mucosa was found; in the other there was ulcer.

Sodium Nitrite Poisoning Treated by Exchange Transfusion. N. G. Kirby. Lancet **1:**594-595 (March 19) 1955 [London, England].

Sodium nitrite, a deadly poison, is contained in machine oils that are increasingly used and are widely obtainable. Kirby reports the case of a girl, aged 11, who was hospitalized 50 minutes after having taken one mouthful of an unknown machine oil, some of which she spat out. The patient was unconscious, pale, and extremely cyanosed. Her pulse and respirations were feeble, and she did not respond to painful stimuli. When nikethamide was given intravenously, the venous blood was seen to be thick and chocolate-brown; methemoglobinemia was diagnosed, and a replacement blood transfusion was started. Rapid clotting persisted until about 1,250 ml. of blood had been transfused. When 1,000 ml. of blood had been transfused and the patient's condition had begun to improve, 30 to 40 minutes after admission, the laboratory, to which a sample of the oil had been sent, reported that it contained 36.5% of sodium nitrite, 7.5% of an emulsifying agent, and 56.0% of water. Sodium nitrite was present in the stomach washings. Altogether 1,700 ml. of blood was transfused. The patient was nursed in an oxygen tent for 48 hours. Pyrexia and increased pulse rate persisted for four days. The white blood cell picture still showed "toxic" granules and Türk's cells six days after the poisoning. When the patient was discharged 14 days after the accident, the blood picture was normal. Sodium nitrite is absorbed rapidly, causing vasodilatation and, in large doses, syncope and methemoglobinemia. Ascorbic acid is of value in the chronic mild cyanotic case, but severe cases of methemoglobinemia require more rapid action. Intravenous administration of methylene blue is effective in the methemoglobinemia following ingestion of nitrites in drinking water by infants, but, in acute poisoning, with a moribund patient, it is more satisfactory to start an exchange transfusion. The removal of the methemoglobin together with any nitrite still circulating and the substitution of transfused blood will lessen the degree of bone marrow damage with the resulting neutropenia. No time should be wasted in waiting for experts in exchange transfusion; the doctor who first sees the patient should give it.

The Jugular Body and Its Tumour. J. H. W. Birrell. Australian & New Zealand J. Surg. **24:**195-206 (Feb.) 1955 [Melbourne, Australia].

After describing the normal jugular body on the basis of his own studies on several temporal bones and after reviewing other reports, Birrell describes a new nonchromaffin paraganglion situated in the jugular ganglion of the vagus nerve. He suggests that all nonchromaffin paraganglia in this area be described under the term jugular body. A series of 11 new jugular body tumors is recorded. Eight of the 11 patients were women; this predominance of women is in accord with previous reports. The scattered distribution of the constituent portions of the jugular body should be remembered as a possible explanation for the diversity of the symptomatology. Thus, if the tumor arises in the region of the jugular bulb, the initial symptoms will be due to a mass in the external meatus and middle ear while a deeper origin in the temporal bone may produce facial palsy, nerve deafness, and vestibular symptoms. The common presenting symptoms are deafness, buzzing in the ear synchronous with the pulse, pain, hemorrhage, otorrhea that may be purulent, and any one of a number of cranial nerve lesions. In all except two of the cases a vascular polypoidal mass was present in the floor of the external meatus; usually this was pulsatile. One patient presented several times, in the six years preceding the development of any other symptoms, with papilledema and raised cerebrospinal fluid pressure. Neurological signs appear almost invariably in late stages of the disease, but in several of the cases in this series gross neurological signs have been present at the first examination. Various combinations of from the 7th to the 12th cranial nerve lesions may be found, while in one case, with a history of at least 20 years' duration, the 5th nerve had been severely affected. In six cases a loud bruit was a source of discomfort and annoyance to the patient. There were two deaths in this series, in each case following operative interference. Autopsies were performed in these two cases, and in one a tumor was found in the transverse sinus and jugular bulb, and in the other case tumor tissue was found in the transverse sinus, jugular vein, and internal auditory meatus. In both cases the tumor projected intracranially from the posterior aspect of the petrous temporal bone. The actual destruction or erosion of bone can be compared with that produced by, for example, a cavernous hemangioma or lipoma of the scalp and is not an expression of malignant invasion per se. In a patient presenting with a vascular polypoidal growth in the floor of the external ear together with radiological evidence of destruction of bone in the region of the petrous temporal bone, there is strong circumstantial evidence for the presence of a jugular body tumor. The behavior of the tumors, their resemblance to the normal jugular body together with the finding of organized nervous tissue are all factors in regarding the tumors as hyperplastic in character. Inimical effects of the tumors are, in practically all cases, a function of their site of origin and not due to a malignant development. No definite treatment has emerged, though ligation of the external carotid artery may be valuable, particularly in association with radiotherapy.

Late Results of Commissurotomy in Patients with Mitral Stenosis. A. Collicelli and L. Lai. Cuore e circolaz. **38:**331-343 (Dec.) 1954 (In Italian) [Rome, Italy].

From November, 1950, to December, 1953, commissurotomy for mitral stenosis was performed in 126 patients at the Institute of Surgical Pathology of the University of Rome. Of these, 17 died—12 during or immediately after the intervention and 5 from three to six months later. The authors discuss the late results obtained in 82 of the survivors who were followed periodically for from one to three years. The group included 54 women—most of them between 20 and 35 years of age—and 28 men. Before the intervention frank mitral stenosis was present in 46, mitral disease in 18, mitral stenosis with aortic insufficiency in 13, and mitral disease with aortic insufficiency in 5. Sinus rhythm was present in 66 and an irregular rhythm due to atrial fibrillation in 16. After the intervention, the functional capacity had become normal in 43 patients who could engage in heavy work, sports, and sexual activities and who could use stimulants (coffee and tobacco) without any difficulty. Two women married, carried a pregnancy to term, and breast fed their babies. The functional capacity improved markedly in 35 patients who complained of a mild dyspnea on exertion, but it remained unchanged in 4. Seventy-eight patients could return to work, and of these 74 resumed their preoperative job, and a marked increase of their working capacity was observed. No definite correlation was found between the improvement in the functional capacity in these patients and the modifications in the

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195

auscultatory signs of stenosis. There seemed to be instead a definite correlation between this improvement and the regression of electrocardiographic and roentgenological alterations. The roentgenograms revealed marked changes in the pulmonary stasis, which, present in all the patients before the intervention, had disappeared in many, decreased in others, and remained unchanged in the four patients to whom the operation was of no benefit. Rheumatic manifestations and tonsillitis were observed in the immediate postoperative period in 21 patients; late rheumatic attacks occurred in seven patients. All these manifestations were easily brought under control with antirheumatic therapy and antibiotics. It is interesting to note that in a certain percentage of patients in whom a commissurotomy is performed the intervention can cause the first manifestation of rheumatic disease or a flare-up of rheumatic activity that was long latent. This was true in 35% of the authors' patients. Whether this justifies the institution of a preliminary antirheumatic therapy and the removal of eventual infected foci before the operation is carried out, even in those patients in whom signs of active rheumatic disease are not present, remains to be determined.

The Asymptomatic Isolated Pulmonary Nodule. E. W. Wilkins Jr. New England J. Med. **252:**515-520 (March 31) 1955 [Boston].

In 77 patients between the ages of 20 and 79 years in whom an asymptomatic isolated pulmonary nodule was observed in the initial chest roentgenogram, an exact diagnosis was established by an operative procedure that consisted of pneumonectomy in 5 patients, lobectomy in 32, segmental excision in 8, and wedge excisions, or simple enucleations, in 30, exploration and biopsy in one, and drainage of a malignant abscess in one. A diagnosis of neoplastic disease was established in 33 patients (42.8%), including 27 with primary carcinomas of the lung and 6 with metastatic lesions. The 27 with primary neoplasms included 11 with adenocarcinomas, 7 with squamous-cell carcinomas, 6 with undifferentiated carcinomas, 2 with pulmonary alveolar adenomatoses, and one with oat-cell carcinoma. Some form of tuberculosis was observed in 18 patients, the diagnosis of hamartoma was made in 11 patients, benign tumors were observed in 10, and inflammatory process was seen in 5. In patients over 50 years of age, 29 out of 50 lesions (58%) proved to be carcinoma. Improvements in techniques of anesthesia, surgery, and care of the patients, as well as the availability of whole blood and antibiotics, have contributed to the safety of exploratory thoracotomy. Because there is no conclusive method for differentiating a malignant from a benign asymptomatic shadow and because of the high prevalence of carcinoma in this group of patients, exploratory thoracotomy, biopsy, and further appropriate extirpation as justified by the situation, must be considered in the management of all cases with symptomless pulmonary lesions in which there is no real contraindication. The results of expectant management with periodic observation by roentgenogram proved disastrous in one of the author's patients, a 64-year-old man, in whom a routine roentgenogram had revealed a discrete, homogenous lesion in the left upper lobe that was causing no symptoms. During six subsequent admissions for incisional and inguinal hernias, repeated roentgenograms were taken, which showed that the shadow in the lung increased slowly in size. A left upper lobectomy was performed, and at this time, four years and nine months after the detection of the lesion, the latter was still symptomless, but pathological examination revealed an adenocarcinoma. For two years after the lobectomy the patient did well, but then widespread recurrent disease appeared in the left hemithorax. Insufficient time has elapsed to permit informative deductions regarding survival rates in the 27 patients with primary pulmonary carcinoma. Prompt excision while a carcinoma is in a symptomless phase offers the greatest hope for its cure.

Operative and Pathologic Findings in 24 Patients with Syndrome of Idiopathic Pleurisy with Effusion, Presumably Tuberculous. W. W. Stead, A. Eichenholz and H. K. Stauss. Am. Rev. Tuberc. **71:**473-502 (April) 1955 [New York].

Stead and co-workers report clinical, operative, and pathological findings in 25 patients who were admitted to the Fitzsimons Army Hospital in Denver, Colo., because of pleural effusions for which tuberculosis was presumed to be the cause. Within a few months of the acute effusion an exploratory thoracotomy was performed in these patients, 15 of whom had clear pathological evidence of tuberculosis in both the lung and pleura. The pleura was thick, fibrous, and granulomatous in these 15 patients. A definite parenchymal focus was found in 12 of the 15 patients; multiple small foci of tuberculosis were observed in all segments of the underlying lung of 7 patients. It appeared that the cause of the pleurisy was an actual rupture of a caseous parenchymal nodule into the pleural space. The mechanism of the effusion appeared to be the same as in the tuberculin-sensitive guinea pigs studied by Paterson in 1917. A review of the literature on pleural effusion showed a high incidence of active pulmonary tuberculosis within the five years immediately following the effusion; this may be explained by the fact that the pleuritis is secondary to caseous tuberculosis within the lung. Surgical exploration in the authors' cases allowed an accurate appraisal of the extent of the tuberculosis. Many of the pulmonary lesions were not even visible in retrospective study of the roentgenograms. In 9 of the 24 patients no evidence of active tuberculosis could be found pathologically. The cases of seven of these patients were characterized by long-continued formation of free pleural fluid. The lower half of the lung was observed to be trapped and compressed by a tough fibrous peel. The fluid formation appeared to be on a hydrodynamic basis. The remaining two patients were considered to have had a spontaneous hemopneumothorax with a resultant fibrothorax caused by a rather large amount of blood in the thoracic cage. Every patient with otherwise unexplained exudative pleurisy should be carefully studied by roentgenography, including planigraphy, for the presence and extent of tuberculosis so that appropriate therapy may be given. If the illness does not follow the typical course for primary tuberculous effusion, an exploratory thoracotomy is warranted for a more accurate diagnosis. A minimum of eight months of treatment for tuberculosis is advisable, even for the typical patient with primary effusion, because of the underlying pulmonary tuberculosis.

NEUROLOGY & PSYCHIATRY

Surgical Treatment of Gliomas of the Brain. C. S. MacCarty. J. Internat. Coll. Surgeons. **23:**290-297 (March) 1955 [Chicago].

Surgical treatment of gliomas of the brain includes such procedures as biopsy and decompression, radical removal of only the tumor or at most the lobe affected by the tumor, and hemispherectomy. Radical removal of the tumor or lobectomy is the type of resection preferred by the author, since this approach to the problem best meets the criteria of (1) reduction of increased intracranial pressure and (2) eradication of the lesion. This method was used for the treatment of 125 consecutive patients, 103 of whom had supratentorial gliomas and 22 infratentorial gliomas. Of the 103 patients, 8 died in the hospital, and of the 22 patients, 3 died in the hospital, a total of 11 hospital deaths (8.8%); this hospital mortality rate is considered encouraging. Roentgen irradiation was used in the postoperative period and was considered of definite benefit as an adjunct to surgical intervention in certain cases. The three-year survival rate in traced patients with supratentorial gliomas was 45.8%, and the five-year survival rate in this group was 34.5%. The three-year survival rate in traced patients with infratentorial lesions was 90.9%, and the five-year survival rate was 100%. The three-year survival rate in traced patients of the total series reported on was 54.2%, and the five-year survival rate was 45.7%. The cases of three women between the ages of 22 and 44 years, of a 50-year-old man, a 12-year-old girl, and a 16-year-old boy are reported in detail; they are representative of the commoner gliomas, including tumors of the astrocytoma type above and below the tentorium, supratentorial and infratentorial tumors of the ependymoma type, a supratentorial mixed glioma and an oligodendroblastoma; these patients survived for five to nine years and at last report were still living useful lives. Patients with medulloblastoma or glioblastoma multiforme did not survive for more than five years.

Neuralgia of the Ninth Cranial Nerve and Indications for Peripheral Section. F. W. Bailey. J. Internat. Coll. Surgeons **23**:315-325 (March) 1955 [Chicago].

Neuralgia of the ninth cranial (glossopharyngeal) nerve is a definite but not a common disease. It has its origin in the superior and petrosal ganglions of the ninth nerve, more probably the former. In differential diagnosis one should consider trigeminal neuralgia involving the second and third divisions of the fifth cranial nerve, neuralgia of the sphenopalatine ganglion, neuralgia of the nervus intermedius, tabetic laryngeal crisis, acute inflammation of the pharynx, and neuralgia of the superior laryngeal nerve. The author observed three patients with this type of neuralgia. In two of them the diagnosis was made with no difficulty, and the condition was treated by intracranial section of the ninth nerve. The third patient was an 85-year-old woman who presented the problems, both of diagnosis and of treatment. For 10 years she had intermittent attacks of burning, shooting pain in the left side of the upper part of the throat, in the tonsillar region, and at the base of the tongue. The pain radiated upward to the front of the left ear and outward to the left side of the face and forward along the left cheekbone. She was unable to swallow because swallowing precipitated pain. Her diet consisted mainly of liquids and soft foods; consequently, she was debilitated. The electrocardiogram showed moderate myocardial damage, with a typical bundle branch block and evidence suggesting left ventricular hypertrophy caused by arteriosclerotic heart disease. In the short period of relief that followed painting the left tonsillar region and the base of the tongue with cocaine, the patient exhibited a rare alertness of mind, a sense of humor, and faith. While intracranial division of the ninth nerve offers a permanent cure for neuralgia of this nerve, it may be hazardous for certain elderly, debilitated patients with cardiac infirmities. It was therefore decided to do a peripheral section of the ninth nerve as close to the top of the superior ganglion as possible, with the patient in the supine position. It did not offer unusual difficulty in the thin, wasted neck of the elderly, debilitated patient. The results of the operation were gratifying. The patient returned to her home on the seventh postoperative day and was able to be up and about. She ate moderately well, gained weight, and lived for one year after the operation without pain. The indications for peripheral section of the ninth cranial nerve are old age, intractable pain of organic origin, a weakened and debilitated condition, complicating cardiac disease, and high morale; the procedure should be adapted to the patient under consideration.

The Physiologic Approach to Diagnosing and Treating Cerebral Palsy. A. Stowell. J. Oklahoma M. A. **48**:67-71 (March) 1955 [Oklahoma City].

Sixty-five patients with cerebral palsy were treated by carotid-jugular anastomosis, 8 by cervical sympathectomy, and 4 by ligation of the internal jugular vein and cervical sympathectomy. There was no mortality and no morbidity; no patient stayed in hospital more than five days, the average being three. Although physiological studies had shown that the anastomosis probably does not increase the amount of oxygen reaching the brain, four patients were dramatically benefited by the procedure, with changes in behavior, electroencephalogram, muscle tone, and convulsions. Six cases are reported. In about 30% of the 25 patients with epilepsy, the frequency and severity of the attacks were improved, and in two severe cases no further convulsions were present three years after surgical intervention. In this epileptic group, the electroencephalographic changes after operation were interpreted as improved in 7 patients, unchanged in 10, and more abnormal in 8. There was very little alteration in the IQ or other psychological tests; it seems inadvisable to operate on patients with very low intelligence quotients. Weakness and ataxia were improved in 12% of the children treated by the anastomosis. In 6 patients improvement ceased at the end of two months, and in 12 no improvement was noted after the third month. In four patients improvement started after six months and in two patients after one year. The beneficial effect of air injection on the occurrence of the convulsive seizures should always be taken into account, since there is often temporary or permanent improvement after it. In general, these procedures are of an experimental nature, and their results have not been satisfactory. Very detailed studies should be made of each patient before and after one of these operations, and patients with severe brain damage should not be operated on except for the purpose of benefiting epileptic attacks. The author believes that cervical sympathectomy is more effective than the shunt procedures.

Familial Occurrence of Bilateral Acoustic Tumors. H. Fahlgren and R. Müller. Nord. med. **53**:237-239 (Feb. 10) 1955 (In Swedish) [Stockholm, Sweden].

In rare cases acoustic tumors are bilateral. Up to 1954, 380 patients with unilateral and 11 with bilateral tumors had been operated on at the Serafimer Hospital. Report is given on bilateral acoustic tumors in six members of one family, representing three generations. In one case diagnosis was verified at autopsy; in three cases it was established clinically and roentgenologically and by operation on one side; in one of two patients, both with clinical signs of bilateral acoustic tumor, operation revealed a cerebellopontine tumor on one side, and in the other case roentgen examination showed widening of the internal porus acousticus on one side. Bilateral acoustic tumors are by many authors considered a form of general neurofibromatosis. As a rule, in familial bilateral acoustic tumors one or more members of the family show signs of general neurofibromatosis. In the family in question such signs were presented by only one member. Dominant inheritance is indicated. The clinical picture does not differ from that in unilateral acoustic tumor except that the symptoms are bilateral and appear earlier than in the unilateral tumors. In the family described the first symptoms set in at the average age of 21.3 years.

Spinal Cord Compression Due to Spontaneous Epidural Hemorrhage: Report of Three Cases. E. W. Amyes, P. J. Vogel and R. B. Raney. Bull. Los Angeles Neurol. Soc. **20**:1-8 (March) 1955 [Los Angeles].

Amyes and his associates present histories of three patients with spinal cord compression due to spontaneous epidural hemorrhage. They emphasize the syndrome of sudden neck, chest, or back pain followed by weakness of the extremities and spinal fluid block. This condition must be differentiated from dissecting aneurysm of the aorta (where there may be blood in the spinal fluid), rupture of an intraspinal vascular anomaly, and sudden extrusion of an intervertebral disk. In the first of the three patients, a man, aged 57, pain in the lower neck and quadriplegia developed rapidly, after he quickly turned the head to one side. Laboratory studies revealed excessive capillary fragility and polycythemia vera. Death occurred 17 hours after onset of symptoms. Autopsy disclosed a large extradural hemorrhage that extended from the base of the skull to the lower thoracic region. In the second patient, a man, aged 70, in whom chest pain and paraplegia began during sleep, a laminectomy was performed two and a half days later with removal of an extradural clot from the third to the seventh thoracic segments. There was postoperative quadriplegia and death five weeks later. Autopsy disclosed extensive softening of the spinal cord. The third patient, a 57-year-old man, experienced sudden onset of low back pain while walking. The pain increased during the next 30 minutes and extended from the lumbar region into the thighs and legs, which felt weak. When seen two days later, the lower lumbar region was tender to palpation. The right lower extremity was almost completely paralyzed, but there was some flexion at the hip and some contraction of the quadriceps could be achieved. The left lower extremity was similarly but less severely affected. At surgery, six days after onset, a hemorrhage was found to extend from T-11 to L-4. Good recovery resulted after removal of the clot. The surgical procedure may prove to be more extensive than that necessary to remove most intraspinal tumors. The onset without trauma may indicate an increased tendency to bleed in some cases. In the first two of these three cases there was evidence of capillary fragility, and increased bleeding tendency may have accelerated the course. No increase in capillary fragility or bleeding tendency was found in the third patient, who recovered after evacuation of the clot.

V 1
195

Symptomatic Therapeutic Action of Cycrimine Chlorhydrate on Parkinsonian Syndromes. J. Sigwald and J. Payot. Presse méd. **63**:375-376 (March 12) 1955 (In French) [Paris, France].

Cycrimine chlorhydrate (Pagitaine hydrochloride) is a synthetic product chemically similar to trihexyphenidyl. It was used by the authors in the treatment of 34 patients with paralysis agitans whose cases had been refractory to other types of treatment. Good symptomatic control was obtained in most cases, and the patients tolerated the drug well on the whole. The authors' results do not make them so enthusiastic about this agent as are American neurologists (Magee and de Jong, Dow and Smith, and Zier and Doshay), but it must be remembered that good comparative clinical trials could not be carried out owing to the scarcity of cycrimine chlorhydrate in France; this accounted for the refractory nature of the case material. It is concluded that cycrimine should be classed on a par with the most active anti-paralysis-agitans drugs: isothazine, trihexyphenidyl, and procyclidine.

Evaluation of Carbon Dioxide Inhalation for Acute Focal Cerebral Infarction. C. H. Millikan. A. M. A. Arch. Neurol. & Psychiat. **73**:324-328 (March) 1955 [Chicago].

Because inhalation of 5% carbon dioxide consistently produces greater increase in cerebral blood flow than does cerebral vasodilatation by any other method, it was decided to study the possible effect of such "treatment" on the clinical course of patients with acute focal cerebral infarction. Of 275 patients with acute cerebral infarction observed at the Mayo Clinic, 225 did not receive any medication designed to produce increased blood flow in the cerebral vessels. Fifty patients received inhalations of 5% carbon dioxide and 95% oxygen administered by means of a BLB mask (oxygen-breathing mask of aviators). Inhalations of the mixture were given for 5 to 12 minutes during each hour for 48 hours after the onset of symptoms and then during the daytime for five additional days. The two groups of patients were compared as regards the neurological deficit present 14 days after infarction. The results were slightly more favorable in the treated than in the contrast group. The treated group of patients is so small in number that no conclusions may be drawn from the study. Perhaps a technique of administering the gas other than that described herein can be devised that will produce a more persistent increase in cerebral blood flow.

Neurologic Signs and Symptoms as Early Manifestations of Systemic Lupus Erythematosus. R. G. Siekert and E. C. Clark. Neurology **5**:84-88 (Feb.) 1955 [Minneapolis].

Three cases of systemic lupus erythematosus are presented in which prominent neurological abnormalities occurred prior to the establishment of the diagnosis of lupus erythematosus. The first patient was a 16-year-old girl in whom Sydenham's chorea and rheumatic fever had occurred four years before and hemiplegia of the left side six months before the appearance of the lesions on the skin. Other neurological abnormalities such as dysarthria, drowsiness, and hemiparesis of the right side were noted in addition to the characteristic cutaneous and visceral lesions of lupus erythematosus when the diagnosis was confirmed. The second patient, a 40-year-old farmer, had an attack of myelitis almost three years before systemic lupus erythematosus was established. The third patient, a 37-year-old woman, had had episodes of diplopia and dizziness, decreased visual acuity, and numbness and tingling of several limbs for six months prior to the diagnosis of lupus erythematosus. She also had true vertigo. In view of these neurological symptoms the diagnosis of multiple sclerosis was considered. Later, after the diagnosis of lupus erythematosus had been made, neurological abnormalities continued to develop. It is suggested that, since systemic lupus erythematosus may be a chronic, smoldering affection, it is conceivable that symptoms referable to the central nervous system might occur well before other more characteristic manifestations of the illness.

GYNECOLOGY & OBSTETRICS

Smears in the Detection of Preclinical Carcinoma of the Uterine Cervix: Further Studies with Emphasis on the Significance of the Negative "Repeats." D. C. Dahlin, L. M. Randall, E. H. Soule and M. B. Dockerty. Surg., Gynec. & Obst. **100**:463-467 (April) 1955 [Chicago].

Dahlin and associates of the Mayo Clinic attempted to formulate a practical program for the detection of preclinical uterine cancer. Their methods and results in screening 30,310 women are discussed. In approximately the first one-fourth of this series smears were made at the discretion of the gynecologist, but in the past two years they have become routine. A cervical smear is prepared from scrapings of the portio vaginalis and, so far as possible, from the endocervix. The smear is fixed immediately in 95% ethanol and stained with hematoxylin and eosin. With the aid of a mechanical stage, the stained slide is examined by a trained technician who marks suspicious or malignant cells. A pathologist, trained in cytology, analyzes the marked slides. He also checks the unmarked smears with a view to deciding whether the specimen is adequate and to spot-check the technician scanners. Unsatisfactory smears (5 to 10% of the total) are deleted from the series unless followed by one containing an adequate sample of epithelial cells. The smear is reported in one of five groups varying from negative (group 1) to malignant cells present (group 5). The probably benign, suspicious, and probably malignant are groups 2, 3, and 4 respectively. The authors believe that the problem is solved only when they have determined the source or nature of the atypical cells. To this end, tissue from the squamocolumnar junctional zone must be delivered to the pathologist. Multiple punch biopsy specimens or a surgical conized specimen from the area of the external os usually provided the answer. The incidence of detection of preclinical carcinoma (pickups) has averaged 0.89%. Of the 270 malignant lesions discovered 267 were squamous cell carcinomas of the cervix. Two were adenocarcinomas of the endocervix, and only one was an endometrial cancer. It should be remembered that patients with symptomatic or clinically obvious carcinoma of the fundus have been deleted from the series. Ninety per cent of squamous carcinomas were in situ. Ten per cent of the smear pickups and 10% of the smear and biopsy pickups were judged to be definitely infiltrating the cervical stroma. The carcinoma detection rate in women who had previously had a negative smear was less than one-fifth that in the original series. In the repeat series of 3,025 cases, carcinomas were found in 5, that is, 1.7 cases per thousand. Cervical scrapings were used in this series rather than vaginal pool aspiration, because it has been shown that vaginal pool secretions are less accurate than scrapings of the squamocolumnar junctional zone for detecting preclinical cervical malignant lesions. Acceptance of the concept of carcinoma in situ of the cervix is essential to any program of detecting these early lesions by the smear-screening technique. Nearly 1% of otherwise normal women will have positive smears.

A Serial-Section Study of the Cervix in Cases with Positive Vaginal Smears and Negative Biopsies: Report of 10 Cases. R. H. Fennell Jr. and R. M. Graham. Cancer **8**:310-314 (March-April) 1955 [Philadelphia].

Fennell and Graham observed in the past two years 10 women in whom vaginal smears contained cells that were believed to originate from a squamous-cell carcinoma, but no histological evidence of carcinoma could be obtained prior to hysterectomy. The hysterectomies were performed for various reasons, such as prolapse, endometriosis, and fibroids; four were performed primarily because of the positive smear report. The uteri were fixed intact and the cervices were blocked completely. The blocks were serially sectioned, and every 10th section was stained and examined. In 2 of the 10 cases, carcinoma in situ was found in the tissue sections. Varying degrees of atypism were found in the other eight patients. These eight cases of false positive vaginal smears represent a false positive error of 5.4%, since in this same period of time positive smears were reported on 118 proved cervical carcinomas and 22 in situ lesions. The his-

tories of four of the eight patients are presented, observations on the other four being similar. In commenting on the apparent discrepancy between the exfoliative cytology and the histology, the authors say that a focus of squamous-cell carcinoma may have been present in the vagina or endometrium, or even in the abdominal cavity, and possibly in the urinary tract. The follow-up interval is too short with most of these patients to rule out these possibilities, and a long follow-up is the only way to eliminate them with certainty. It has been suggested by Scapier that the standard vaginal preparation, using a gauze sponge, may be sufficiently traumatic to remove all of the abnormal epithelium. Experimental work lends support to this thesis, and in histological study areas of carcinoma in situ are often partially or completely detached from the underlying stroma. Then there is the question of whether in examining sections 50 μ apart a tiny focus of carcinoma might have been missed. Since the carcinoma could not have been more than eight cells in depths, the authors regard it as unlikely that a carcinoma was missed. They feel that these cases reemphasize the need for histological confirmation before treatment and the need for careful study of the patient with a positive smear and negative biopsy.

Puerperal Mastitis in the Penicillin Era: Observations in 1,100 Cases from the City of Leipzig. H. Noack. Geburtsh. u. Frauenh. **15**:224-246 (March) 1955 (In German) [Stuttgart, Germany].

A survey of 1,100 patients with puerperal mastitis observed at the three obstetric clinics of Leipzig, Germany, between June 1, 1950, and March 31, 1954, revealed that its incidence has increased from 3.9% in 1950 to 7% in the first trimester of 1954. In contrast to these findings, a correspondingly increased incidence of mastitis was not observed among women who were delivered in their homes, mastitis occurring in only about 1% of these women. The causative agent of the hospital-mastitis is a penicillin resistant strain of Micrococcus (Staphylococcus) pyogenes var. aureus. Two-thirds of the cases of mastitis were late cases; the disease appeared on the 28th day, on the average, after the delivery. The incidence curved reached its culmination point at the end of the third week after delivery. There was a tendency towards mastitis predominantly among primiparas (69% primiparas among mothers with mastitis). The maternal resistance to the micrococci was presumably reduced by the discharge from the clinic. Meteorobiological influences are suggested by the fact that the highest incidence of the disease was observed in the month with the most frequent changes in cold and warm air fronts. The incidence of mastitis was the same on the left and on the right side. Bilateral mastitis was observed in 24% of the patients. The outer quadrant of the mammary gland was affected two times as frequently as the inner quadrant. Central mastitis occurred in 10% of the cases. There was no relationship between the occurrence of mastitis and duration of delivery, age of the parturient woman, birth trauma, and the sex of the infant. Early mastitis associated with fever for one to three days was easily controlled by treatment, since breaking down of tissue occurred only rarely. Early mastitis, therefore, should not be used for the evaluation of any method of treatment. Fever continued for more than three days in 583 patients, and in only 175 (30%) of these was it possible to prevent breaking down of tissue. Conservative treatment with streptomycin and chloramphenicol (Chloromycetin) was highly effective when administered early, while results obtained with sulfonamide compounds alone or combined with penicillin were less favorable. The author cautions against the use of penicillin, since he believes that it may even be harmful. Among the bacterial populations that are resistant to penicillin there may be strains that are "penicillin addicts." Weak roentgen irradiation proved to be an effective conservative method. The type of the incision is not of importance with regard to active treatment, but it is strongly emphasized that one should wait for the complete breaking down of tissue. Prophylaxis of mastitis must aim at the radical improvement of lying-in hygiene to overcome the "bacterial hospitalism" with all the reliable means of disinfection, such as ultraviolet light and aerosols. Antibiotic prophylaxis is contraindicated because it favors the development of antibiotic-resistant strains of micrococci.

Metastatic Pulmonary Chorionepithelioma with Recovery in Two Cases. J. F. Nolan, E. M. Cook Jr. and W. E. Dallke. West. J. Surg. **63**:101-106 (March) 1955 [Portland, Ore.].

Nolan and associates present clinical histories of two women, aged 27 and 20, respectively, who were treated for chorionic trophoblastic tumors of the uterus and radiological evidence of pulmonary metastasis. In both instances pelvic surgery and postoperative teletherapy with Cobalt 60 were utilized, and the patients have survived without evidence of recurrence 24 and 18 months respectively. It may well be that one of these patients did not have a true choriocarcinoma and that the pulmonary involvement may have undergone dissolution without any treatment after the primary nidus of residual tumor had been excised surgically. In the second instance, although the tumor was malignant according to pathological and clinical criteria, the radiation therapy may not have been the prime factor in favorable response, since nitrogen mustard therapy was also utilized. These patients presented interesting clinical problems in their management. While the authors agree with Novak that the histological structure is important for the conduct of therapy, they also point out that discrepancies occur between the clinical activity of a tumor and its histological appearance. Even normal trophoblastic tissues frequently exhibit properties associated with malignant tissues, namely, rapid growth, local invasion, and distant metastasis. Trophoblastic tissue is derived from the ovum and the usual tumor tissues from the host, but the difference between the biological activity of benign and malignant trophoblastic tumors seems to be in host restraint or control. Since there is no measurement of possible host reaction, one must rely on the pathologist's opinion of the morphological characteristics of the tumor.

Chorio-Angioma (Haemangioma of Placenta) Associated with Acute Hydramnios. R. A. McInroy and H. A. Kelsey. J. Path. & Bact. **68**:519-523 (Oct.) 1954 [Edinburgh, Scotland].

Hydramnios sometimes develops in association with angiomatous tumor of the placenta. It occurs apparently more often with the larger tumors, as in the case here described, which concerned a 20-year-old woman in her sixth month of pregnancy, in whom vomiting had become severe two days before admission. She responded to treatment and was discharged 11 days later. Twenty-five days later she was readmitted in labor. The uterus was of full-term size, although she was believed to be only seven months pregnant. There was a marked fluid thrill. She said that her abdomen had grown rapidly bigger during the previous week. Acute hydramnios was diagnosed, and high rupture of the membranes was performed, some 6 pt. (3,400 ml.) of straw-colored amniotic fluid being withdrawn. The fetus was delivered spontaneously after eight hours of labor. After delivery, the uterus was still the size of a 28-30 weeks' pregnancy, but about one hour and five minutes later, uterine contractions again began and a tumor mass the size of a grapefruit was expelled. The placenta followed immediately afterward, the two masses being joined by a short stalk. The tumor weighed 454 gm. and was solid and fleshy. The placenta weighed 650 gm. and appeared normal. The infant, whose maturity was thought to correspond to a gestation of 32 weeks, died eight hours after delivery. Autopsy of the infant showed that death was due to subarachnoid and subdural hemorrhage resulting from a tear in the tentorium cerebelli. Large chorioangiomas, because of the resulting hydramnios, tend to cause premature birth. Prematurity itself carries the risk of neonatal mortality, but placental insufficiency probably plays a major part in determining the fate of the infant. Bypassing of the fetal blood into the highly vascular tumor bed may be responsible for the development of hydramnios. An analogous occurrence is that of acute hydramnios in one sac of a uniovular twin pregnancy. In both conditions the functional insufficiency of the placenta probably stimulates increased excretion of waste metabolites, by the fetal kidneys, the lungs, or both, and hydramnios results either directly from the excessive excretion of fluid or indirectly from an increase of osmotic tension of the amniotic fluid. Both mechanisms may perhaps operate.

V 1
195

Present-Day Concepts of Manual Removal of the Placenta. W. O. Thomas Jr. West. J. Surg. **63:**129-145 (March) 1955 [Portland, Ore.].

Thomas compares observations on manual removal of the placenta for the period from 1937 to 1944, when 48 placentas were removed manually in 17,940 deliveries, with those during the period 1950 to 1953, when 324 manual removals were carried out in 18,375 deliveries. The puerperal morbidity rate was 14% (7 in 48 cases) in the first group and 1.9% (6 in 324 cases) in the second group. No fatalities occurred in either group. Better obstetrics, earlier removal of the placenta, increased use of blood transfusions, and antibiotics have all contributed to the lowering of the morbidity. In the 1950 to 1953 series there were 169 patients without morbidity or mortality and who did not receive chemotherapy or antibiotics. Sixty-two per cent of these placentas were removed in less than 15 minutes, and 93% had been removed by the end of 30 minutes following delivery. A properly carried out manual removal of the placenta, if done early enough (by the end of 15 minutes), providing, of course, there are no other complications, may well obviate the necessity for either transfusion or antibiotics.

Internal Incarcerated Hernia After Operation for Retroflexion of the Uterus. J. L. M. H. Specken. Nederl. tijdschr. geneesk. **99:**477-484 (Feb. 12) 1955 (In Dutch) [Haarlem, Netherlands].

Specken presents histories of two women in whom internal hernia developed after Doleris' operation for retroflexion of the uterus. Symptoms of ileus appeared in one woman about three years after the Doleris operation and in the other patient about 18 months later. The author evaluates the various operations for retroflexion of the uterus and gives special attention to the recommendations regarding the prevention of ileus following the operation of Doleris. Surgeons should choose the technique that reduces the danger of internal hernia and ileus. Reviewing the cases from the literature in which internal hernia and ileus resulted after the Doleris operation, the author finds that many of the women had vague abdominal symptoms and signs of temporary ileus during the period preceding the development of incarcerated internal hernia. He hopes that physicians will be alert to these abdominal symptoms in women who have been operated on for retroflexion of the uterus.

PEDIATRICS

Interstitial Plasma Cell Pneumonia. S. D. Sternberg and J. H. Rosenthal. J. Pediat. **45:**380-393 (April) 1955 [St. Louis].

Four cases of interstitial plasma cell pneumonia, a type of infantile pneumonia occurring chiefly in Europe that is both clinically, and pathologically distinctly different from the usual respiratory diseases seen in the United States, are described in three girls and one boy between the ages of 10 weeks and 3 months who had been adopted by American personnel from German orphan homes. All four patients recovered. According to reports in the literature mortality rates of the disease have been as high as 50%. The authors' observations in the four infants and data either collected from the European literature or obtained from discussions with German pediatricians revealed that interstitial plasma cell pneumonia shows a predilection for premature and dystrophic mature infants. The disease becomes clinically recognizable only in the age group between 6 weeks and 4 months. Before the onset of dramatic symptoms, the only noticeable clinical signs are related to feeding, decrease in intake, vomiting, and lassitude being the most common. After a slow onset, a rapid progression of symptoms takes place, consisting of increased respiratory rate, retraction of the chest walls with flaring of the flanks, cyanosis about the mouth, and a generalized grayish cyanotic tinge. Physical examination of the chest is essentially negative and the temperature is usually normal. If the infant does not survive, this picture becomes progressive until the infant dies of asphyxia. If the child survives, after a severe critical period of from one to four weeks, one may begin to hear showers of rales in the chest and the signs and symptoms of respiratory illness slowly disappear. The infant may remain completely asymptomatic throughout the course of the disease and yet may show a very diffuse roentgenographic involvement. The roentgenographic picture is of prime diagnostic aid, since the infiltration is practically identical in all the cases of this disease, both in its quality and distribution. Diffuse, hazy, milk-like infiltration in both lung fields sparing the peripheral parts of both lower lobes is characteristic of acute interstitial plasma cell pneumonia. The causation of this type of pneumonia is unknown, but the disease acts like an infection in its epidemiology. No present-day therapeutic measures seem to be of any definite value. The authors feel that supportive therapy with oxygen mist contributes to the general improvement.

Congenital Acute Leukemia: Skin Nodules, a First Sign. D. L. Reimann, R. L. Clemmens and W. A. Pillsbury. J. Pediat. **46:**415-418 (April) 1955 [St. Louis].

A case of congenital myeloid leukemia with specific skin nodules is described in a baby girl who at birth appeared to be normally developed and in good health. Satisfactory respiratory functions were promptly initiated, and there were no cardiovascular abnormalities. The only perceptible flaws in this infant were "knots" in the skin. There was no lymphadenopathy, hepatomegaly, splenomegaly, or pallor. Of the 6,900 leukocytes per cubic millimeter, 29% were interpreted as neutrophilic polymorphonuclear granulocytes, 8% as monocytes, 2% as eosinophils, and 6% as normoblasts, and 56% were erroneously interpreted as lymphocytes. Additional lumps had developed in the skin of the torso, extremities, and in the scalp when the infant was seen four weeks later. The lesions were discrete and firm, having the consistency of fibromas. Impressions gained by microscopic examination included unclassified malignant tumor, angioendothelioma with extramedullary hematopoiesis, and fungous infection. The lesions were composed of globoid or polyhedral cells, tightly packed in an organoid array. There was nothing about the lesions that resembled leukemic infiltration, but there were few small cells possessed of compact nuclei that were hesitantly interpreted as hematopoietic. Respiratory and cardiovascular functions, nutrition, and excretory habits of the infant were normal. The leukocyte count at this time was 9,000 per cubic millimeter. At the age of 13 weeks the infant was readmitted with fever, persistent vomiting, pallor, exophthalmos, lymphadenopathy, and skin nodules that had enlarged again. The liver was enlarged and the spleen palpable. The peripheral blood contained 89,000 leukocytes per cubic millimeter and 3,200,000 erythrocytes per cubic millimeter. The platelet count, which previously had been 220,000, dropped to 25,000 per cubic millimeter. Primitive myeloid cells dominated the blood smear. A similar disproportion of myeloid cells existed in the marrow. When the child was 14 weeks old, the leukocyte count dropped to 40,000 per cubic millimeter and the infant died. Skin nodules may be the first sign of congenital leukemia. The nodules are histologically characteristic even though leukemia infiltration or hematopoiesis is inconspicuous. The authors' case is the first reported in which skin nodules preceded hepatomegaly, leukocytosis, petechiae, and other outward signs of leukemia.

Exchange Transfusion in Hemolytic Disease of the Newborn. W. Walker and G. A. Neligan. Brit. M. J. **1:**681-691 (March 19) 1955 [London, England].

Of 272 newborn infants with hemolytic disease selected for exchange transfusion between March, 1947, and March, 1954, 250 received technically satisfactory exchange transfusions. Of the 22 inadequate transfusions 19 were performed in 1947 and 1948 and only 2 in 1949 and one in 1951. The authors believe that cord hemoglobin and bilirubin levels permit selection of practically all infants likely to require treatment; any infant with a cord hemoglobin level of 14.8 gm. per 100 cc. or less and any infants with cord hemoglobin level between 14.8 and 17.7 gm. per 100 cc. associated with a cord bilirubin level of 2.8 mg. per 100 cc. or more should be given exchange transfusions. The authors always aimed to exchange 80 cc. of blood per pound (176 cc. per kilogram) of body weight, or twice the infant's estimated blood volume. Their secondary aim in performing exchange transfusion was to achieve a final hemoglobin level of between 15 and 17 gm. per 100 cc. This reduces the possibility of further transfusion being required, and it depresses erythropoiesis and the production of cells liable to rapid hemolysis. It is convenient and satisfactory to start exchange transfusions

within the first nine hours of life in hospital-born infants in whom hemolytic disease of the newborn infant has been diagnosed by tests on cord blood. In infants desperately ill at birth, with a hemoglobin level of less than 6 gm. per 100 cc. and signs of heart failure, immediate treatment may be called for, as in six of the authors' cases in which transfusion was started within the first hour of life and three of whom survived. Of the 250 infants, 22 were premature, 37 were mature infants born at home or in hospitals not affording special facilities, and 191 were mature infants born in hospitals affording special facilities. Neonatal death caused by hemolytic disease of the newborn occurred in 6 (27%) of the 22 patients, in 4 (11%) of the 37 patients, and in 5 (2.6%) of the 191 patients. Of the 15 deaths attributed to hemolytic disease of the newborn infant, 2 resulted from fetal hydrops, 3 from kernicterus, 5 from heart failure, 2 from generalized bleeding, one from cardiac arrest, one from cirrhosis, and in one the cause was not known. Kernicterus occurred in only 2 of 196 mature infants but in 3 of 22 premature infants treated by early adequate exchange transfusion. This disproportionate risk between mature and premature infants corresponds with the authors' observation that after exchange transfusion deep jaundice developed in 45% of premature infants, but in only 13% of mature infants. Repeated exchange transfusions should be necessary in a very small proportion of cases and these mainly in premature infants. Exchange transfusion is a safe routine procedure and is recommended as the treatment of choice for the 60% of liveborn infants affected with hemolytic disease of the newborn infant requiring treatment. In experienced hands exchange transfusion carries a very low operative risk, and this risk is practically confined to infants whose chance of survival would be very poor if treated by other means. Premature infants have a significantly worse chance of survival than mature infants owing mainly to the increased risk of kernicterus. Linked with laboratory prediction beforehand and skilled care afterwards, exchange transfusion of 80 cc. per pound (176 cc. per kilogram) of body weight, carried out within nine hours of birth, should ensure a satisfactory outcome in most cases.

Staphylococcal Infection in the Newborn Treated with Erythromycin. J. O. Forfar, A. F. Maccabe, C. L. Balf and others. Lancet **1**:584-587 (March 19) 1955 [London, England].

The present investigation was designed to test the efficacy of erythromycin (Ilotycin suspension) in neonatal micrococcic (staphylococcic) infection and particularly to determine whether resistance would appear quickly under controlled conditions. The trial took place in the maternity units of two hospitals. In hospital E all clinical infections were treated with erythromycin, given 20 mg. per pound of body weight daily by mouth in divided doses at six-hour intervals. In hospital W clinical infections were treated with the same dosage of erythromycin at the same intervals, but in addition a daily injection of streptomycin (0.125 gm.) was given. It was hoped by this means to determine whether combined therapy would reduce the risk of resistant strains emerging. Streptomycin was chosen because in these units 80% of strains of Micrococcus pyogenes were sensitive to it. The incidence of clinical infection was 14% in hospital W and 13% in hospital E. Of the 140 babies with clinical infection in hospital E, 89 had conjunctivitis, 19 had skin pustules, 13 had infection of the umbilical stump, 9 had local cellulitis or paronychia, and 10 were not adequately documented. The 112 cases of clinical infection in hospital W comprised 68 cases of conjunctivitis, 27 of skin pustules, 4 cases of infections of the cord stump, and 13 cases of cellulitis or paronychia. The average duration of treatment was about four days, with a range of two to nine days. There were no failures in the treatment of deep and superficial skin sepsis, but 8% of the cases of conjunctivitis did not respond. Erythromycin with streptomycin proved no more effective than erythromycin alone. Phage-typing showed that a limited number of strains were responsible for the cases of clinical infection. No strain of M. pyogenes developed resistance to erythromycin during the trial. The extent of resistance to five other antibiotics and to sulfonamide is shown. Strains of the same antibiotic resistance pattern and phage type were isolated from the babies and from the staff, showing that there was free interchange of micrococci between staff and infants and between one infant and another, and that cross infection was common. The increased use of streptomycin in one unit during the trial appeared to increase the proportion of streptomycin-resistant organisms among micrococci isolated from staff nasal carriers in that unit. Erythromycin did not interfere with the normal growth of Escherichia coli in the gut, and no case of fungus or micrococcic infection of the alimentary tract was found.

Neonatal Diarrhea and Otorhinolaryngology. A. Correa, J. C. Soares Bicudo and A. Taunay. Rev. Assoc. med. brasil. **1**:286-288 (Sept.) 1954 (In Portuguese) [São Paulo, Brazil].

Otorhinolaryngological examinations for pathogenic enteric bacteria were made on 55 newborn infants with neonatal diarrhea within the first month of life, 20 normal newborn infants in the first two weeks of life, and 13 nurses of the Maternity Hospital of the Hospital das Clinicas of São Paulo. In the group of patients with diarrhea, acute otitis media developed in 3 out of 13 patients harboring pathogenic enteric bacteria in the feces, one harboring them in the oropharynx, and in 18 out of 41 patients who did not harbor them in the feces or in the otorhinolaryngological structures. Three patients died shortly after hospitalization. In the remaining patients the treatment consisted of paracentesis followed by streptomycin and/or sulfadiazine in cases of suppurating acute otitis media or else conservative treatment alone in cases of congestive acute otitis media. Patients with rhinitis or rhinopharyngitis recovered spontaneously in a few days. In none of the cases of acute otitis media was the ear infection caused by the same bacteria that caused the intestinal infection. It was observed in the group of normal infants that the otoscopic findings are difficult to interpret in infants of that age. The test of pressure of the tragus for patients with otitis media gives false results in 50% of the cases. Nonpathogenic enteric bacteria were identified in the nasal fossa or the oropharynx in 50% of the infants artificially fed. Pathogenic enteric bacteria appeared in the nasal fossa or the feces in four normal infants. On the next day, neonatal diarrhea appeared. It followed a rapid, benign course. None of the nurses harbored pathogenic enteric bacteria. The authors conclude that neonatal diarrhea, especially if complicated by acute otitis media, is one of the most serious diseases of newborn infants. Otorhinolaryngological infections are secondary to neonatal diarrhea and aggravate the diarrhea. The examination of newborn infants with neonatal diarrhea should be made and directed by the pediatrist in collaboration with the otorhinolaryngologist and the bacteriologist, in order to control the clinical, bacteriological, and otorhinolaryngological factors that may be involved in the etiology, course, and treatment of neonatal diarrhea.

Clinical Picture of Severe Generalized Viral Infection in the Newborn. J. H. Colebatch. M. J. Australia **1**:377-382 (March 12) 1955 [Sydney, Australia].

Generalized infection of viral nature causing a fatal illness in early infancy has been known as generalized visceral inclusion disease of infancy, as generalized cytomegalic inclusion disease, or as generalized salivary gland virus infection. Characteristic inclusion bodies are found in the nucleus and cytoplasm of the enlarged cells of various organs, most commonly the lungs, kidneys, liver, and pancreas. Isolation of the virus causing this disease has not been successful. In 1941 the virus of herpes simplex was shown to be responsible for a fatal encephalitis with similar intranuclear inclusion bodies developing in the neonatal period, and there have been other reports of fatal generalized visceral infection in the first week of life, in which the cause was definitely established as the virus of herpes simplex. The striking similarity of the clinical pictures produced by these two apparently separate diseases prompted a study of the clinical features of cases reported in the literature and of similar cases encountered in Melbourne in recent years. One probable case of generalized cytomegalic inclusion disease is described, and an analysis is presented of the clinical data from 15 case histories of herpes simplex viremia. Five cases considered to be examples of herpes simplex viremia are described. The differential diagnosis of these two clinically similar but apparently separate virus infections is discussed. Though they have many pathological features in common, cytomegalic inclusion disease

is far more prone to affect the kidneys, pancreas, thyroid, and salivary glands, its lesions show less necrosis, and, above all, the cells containing inclusion bodies show a much greater degree of enlargement, for which reason Goodpasture and Talbot applied the term "cytomegalia." In herpes simplex viremia the liver, adrenal cortex, oropharynx, and esophagus are most often involved, necrosis is a prominent feature, and huge inclusion-bearing cells are not seen. The pathologist at autopsy should be able to differentiate these two diseases. Clinical data are presented to indicate that antecedent debilitating factors may play a significant role in these severe neonatal virus infections.

Penicillin Treatment for Early Congenital Syphilis. C. A. Smith, G. A. Gleeson and K. H. Jenkins. Arch. Pediat. **72:**12-25 (Jan.) 1955 [New York].

Penicillin therapy for congenital syphilis was administered to 472 children 2 years old or younger, 38% of whom were followed up for a period of at least 18 to 21 months. Results of treatment were judged on the basis of this group. A significantly higher rate of seronegativity was attained in those children who were treated during the first year of life, regardless of the total amount of penicillin administered. All clinical or serologic failures occurring among those treated during the first three months of life were among those receiving less than 800,000 units of penicillin. All other patients in this age group were seronegative at 18 to 21 months after treatment. The pattern of serologic behavior in congenital syphilis after treatment during the first two years of life is analogous to that in acquired syphilis through the early stages of infection and latency. On the basis of this and other studies using aqueous solutions of sodium or potassium penicillin G, the minimum dosage for the successful treatment of early congenital syphilis is 321,000 units of aqueous pencillin G per kilogram of body weight, or, roughly, a total of 1,200,000 units to adult dosage level (4,000,000 to 4,800,000 units) according to the age of the child under treatment. Favorable results among the few patients treated with penicillin in oil and beeswax indicate that equivalent dosages of the delayed absorption types of penicillin are effective in the treatment of early congenital syphilis. Bismuth was used as an adjunct to penicillin therapy in some cases of the present series of patients.

Tetanus as a Pediatric Problem: Analysis of 21 Cases. M. Q. Jenkins and M. W. Beach. J. South Carolina M. A. **51:**66-71 (March) 1955 [Florence, S. C.].

Twenty-one cases of tetanus have been treated by the pediatric staff of the Medical College of South Carolina during the years 1948 through June, 1954. The problem of tetanus in the newborn infant is quite different from that in children, and, therefore, these patients have been divided into two groups of 14 children and 7 newborn infants. The ages of the children ranged between 4 and 14 years. There were 10 males and 4 females. All except one of the 14 cases occurred during the summer months. This is undoubtedly due to the increased outdoor activity of children during these months. The lower extremity was found to be the site of injury in 11 of the patients, and lacerations were a slightly more common type of injury than puncture wounds. Although it has been asserted that the prognosis is poor if symptoms occur less than seven days after injury and more favorable if symptoms are delayed beyond seven days after injury, there were three fatalities in this group of 14 patients, and in all of these fatal cases the incubation period was seven days or longer. The usual site of infection with tetanus bacillus in the neonatal period is the umbilical cord. Evidence of infection of the umbilicus was found in all of the infants with tetanus neonatorum. The age of these patients, and therefore probably also the incubation period, varied from 4 to 21 days. Only one of the seven newborn infants was born in the hospital, the others having been delivered by midwives. Four of the seven infants died. None of the children in this series had received adequate immunization against tetanus. The therapeutic doses of tetanus antitoxin given ranged between 50,000 and 120,000 units. Three received part of the total amount on the second and third days of admission, and two of these were patients with fatal cases. Only three patients received antitoxin around the wound in addition to the intramuscular injection. One patient with "localized" tetanus did not receive antitoxin, since his condition had improved by the third day after admission, when the diagnosis of tetanus was made. In tetanus neonatorum the dose of antitoxin given was 40,000 to 100,000 units in a single intramuscular dose.

Treatment of Acute Rheumatic Fever in Children: Co-Operative Clinical Trial of ACTH, Cortisone, and Aspirin. Joint Report by the Rheumatic Fever Working Party of the Medical Research Council of Great Britain and the Subcommittee of Principal Investigators of the American Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association. Brit. M. J. **1:**555-574 (March 5) 1955 [London, England].

Six centers in the United Kingdom, five in the United States, and one in Canada collaborated in a trial of the relative merits of corticotropin, cortisone, and aspirin in the treatment of acute rheumatic fever and the prevention of rheumatic heart disease. The records of 497 patients are presented (240 from the United Kingdom and 257 from the United States, including the Canadian center in the latter); the patients were all under 16 years of age, and each was followed for one year after treatment. The length of treatment, conducted according to a standard schedule, was six weeks, no matter which agent was used. Detailed observations were continued for a further three weeks, and follow-up examinations were made at specified periods thereafter; this report is based on the examination made at the end of the one year period, that is, 61 weeks after the beginning of treatment. In 51% of the patients, treatment was begun within 14 days of the onset of the attack; in nearly two-thirds there was no history of a previous attack or evidence of preexisting rheumatic heart disease. The three randomly selected groups given corticotropin (162 patients), cortisone (167 patients), and aspirin (168 patients) were notably alike in most respects at the start of treatment. The results of treatment were measured in relation to separate manifestations of the disease, namely, temperature, pulse rate during sleep; erythrocyte sedimentation rate, joint involvement, chorea, erythema marginatum, nodules, and such aspects of the status of the heart as heart size, atrioventricular conduction time, murmurs, and, in particular, those indicative of serious illness, congestive failure, and pericarditis. There was no evidence that any of the three agents resulted in uniform termination of the disease, and with all treatments some patients had fresh manifestations during treatment. Treatment with either of the hormones resulted in more prompt control of certain acute manifestations, but this more rapid disappearance was balanced by a greater tendency for the acute manifestations to reappear for a limited period on cessation of therapy. Treatment with the hormones also led to more rapid disappearance of nodules and soft apical systolic murmurs. At the end of one year there was no significant difference between the three groups in the status of the heart. During the period of treatment, observation, and follow-up, there were only six deaths among the 497 patients.

Study of Cases of Chronic Fibroelastic Myoendocarditis (Endocardial Fibroelastosis) Seen at the Infant Clinic of Strasbourg from January, 1947, to January, 1954. R. Sacrez, L. Fruhling and C. Adam. Pédiatrie **10:**129-143 (No. 2) 1955 (In French) [Lyon, France].

Between Jan. 1, 1947, and Jan. 1, 1954, all enlarged hearts of children less than 10 years old dying at the Infant Clinic of Strasbourg, France, were examined, and 13 cases of chronic fibroelastic myoendocarditis were discovered. About 10,000 children had been admitted to the clinic during this period; this incidence of 0.13% indicates that the condition is not so rare as is generally supposed. Twelve of the patients were under 2 years of age, but one girl died of her disease at the age of 8½ years. Onset was sudden in three-fourths of the cases and led rapidly to death; in the patients with the progressive form of the disease, death was preceded by bouts of cyanosis and dyspnea. Most of these children were underdeveloped, some had anorexia, and about a third of them had digestive disorders, in the form of vomiting and diarrhea. The most consistent clinical sign is enlargement of the size of the heart; this increase is usually rapid. In fact, it is a terminal phenomenon, secondary

to the myoendocarditis. The heart sounds vary from patient to patient; sometimes only tachycardia and general dulling of the heart sounds are noted; sometimes there is a systolic murmur or even gallop rhythm. Electrocardiography reveals disturbed repolarization and myocardial ischemia. Hepatomegaly was present in about half of the authors' cases. Splenomegaly is rare. There is usually some anemia, sometimes with slight leukocytosis. Fever was noted during the course of the disease in over half the patients; the temperature was sometimes elevated at the time of death. Death is sometimes due to an intercurrent infection. Two unusual features of this series are worth noting: one child had spasmophilic convulsions on the day of his death, and another was found at autopsy to have fibrocystic disease of the pancreas. The authors observed that the age of the child at death did not correspond well with the histological stage of evolution of the lesions seen in every case. One of the patients was a newborn infant; in that instance as well as others the disease must have had its onset in utero, judging by the age of the lesions. The authors found evidence of myocardial inflammation in every one of their cases. Their opinion is that the primary lesion is myocarditis, inducing proliferation of the parietal endocardium by irritation. When this irritation is slow and prolonged, the scleroelastic proliferation is predominantly elastic, but, when the irritation is relatively more recent and of more rapid evolution, fibroelastic proliferation giving way to sclerotic proliferation is the result. The myocardial lesions, which are at first florid, tend progressively to diminish. The granuloma is replaced by fibrosis, then sclerosis. In view of this, the authors postulate an inflammatory origin of the disease and propose that it be called chronic fibroelastic myoendocarditis rather than endocardial fibroelastosis, because the former name indicates the order in which the lesions follow each other.

DERMATOLOGY

Skin Lesions After Vaccination. J. W. H. Mali, W. C. M. van Hinsbergh and A. Hamers. Nederl. tijdschr. geneesk. **99:**252-257 (Jan. 22) 1955 (In Dutch) [Haarlem, Netherlands].

In the course of a revaccination campaign that was carried out in May, 1951, in Noord-Brabant, the Netherlands, because of an outbreak of smallpox, skin eruptions were observed that differed from previously described forms in clinical aspects and in time of appearance. The incidence of these skin lesions is difficult to ascertain, because it is possible that only a small part of the persons in whom they developed consulted a physician or a skin specialist. Mali and associates observed 22 patients in from two to three weeks. All of the 22 patients, except one girl, aged 3, had been vaccinated before. A papuloerythematous or a vesiculobullous eruption appeared chiefly on the face and on the extensor surfaces of the extremities about three weeks after vaccination. In three patients the upper part of the trunk was likewise involved. The lesions disappeared in from one to two weeks and left no scars. In one patient the lesions recurred for about six months. Large multiple-chambered bullae were also observed in some cases. The authors believe that the lesions were caused by a hypersensitivity to the vaccinations or to substances in the vaccine.

Silicon Granuloma of the Skin. P. M. Crossland. A. M. A. Arch. Dermat. **71:**457-461 (April) 1955 [Chicago].

Traumatic silicon granuloma of the skin simulates the cutaneous manifestations of sarcoidosis, tuberculosis, and other granulomas. The latent interval between siliceous implantation and appearance of lesions is usually very long. The case presented here concerned a woman, aged 23, who in January, 1953, presented herself for treatment with an eruption in scars on both knees. The eruption had appeared one month previously. In 1940, this patient had fallen on a gravel playground, abrading her knees. The wounds were bandaged and healed in about three weeks, with scarring. The eruption, which was confined to the exact sites of scars from the fall 11 years previously, consisted of nontender, firm, erythematous papular lesions. Histological examination of a specimen showed a sarcoid-like reaction of epithelioid and Langhans' giant cells in the upper part of the cutis. Scattered throughout the sections were small, irregularly shaped crystalline particles, a few of which were engulfed by giant cells. No treatment was given, but six months after the initial dermatological examination the lesions had regressed spontaneously, leaving only a copper-colored pigmentation. The characteristic features of silicon granuloma of the skin are: a history of trauma involving some siliceous substance, a long latent interval, and appearance of papular or nodular lesions at the exact sites of injury, often in scars. Microscopically, all lesions show a typical sarcoid reaction, with doubly refractile crystalline material demonstrable under polarized light. Since cholesterol, cholesterol esters, and other organic lipids are also doubly refractile under polarized light, conclusive proof of the siliceous nature of anisotropic crystals can be established by means of microdissection and roentgen absorption spectrography. It is suggested that silicon may play a role in the development of granuloma from contact with broken fluorescent bulbs.

Partial Albinism. N. G. Smith and J. Schulz. A. M. A. Arch. Dermat. **71:**468-470 (April) 1955 [Chicago].

Partial albinism consists of patches of depigmentation and usually a white forelock. There is confusion about the disorder and its relation to vitiligo. The latter is by definition an acquired depigmentation. Vitiliginous lesions have hyperpigmented borders and frequently change in size, features that are not present in partial albinism. The most remarkable facet of partial albinism is its genetic implications. This trait is inherited as a dominant Mendelian characteristic. The authors present the pedigree of a family, which was traced through four generations, in which partial albinism was observed in 22 of 43 known members. The histories of 2 of the 22 patients, a 35-year-old woman and her prematurely born daughter, are presented. The woman had a white forelock. Her face, arms, and back showed no abnormal pigmentation. The anterior portion of the trunk showed mainly depigmented areas with a few patches of normally pigmented skin in the epigastric region and a triangular-shaped area of normal skin below the umbilicus. The legs presented a striking picture, with alternate patches of depigmentation, normal pigmentation, and hyperpigmentation. The authors are unable to explain the hyperpigmented spots, which have never been described in other cases of partial albinism. During the second week of the infant's life, when the skin color became less florid, wide bands of depigmentation were noted on the abdomen, thighs, and legs. A white, right-sided forelock was also present. The authors believe that the family presented here is the 25th reported, and the 6th American family with partial albinism. Three of the six American families have been Negro. The depigmented areas are located most commonly on the anterior part of the thorax and abdomen. The back is usually not affected. The extremities are rather frequently involved, although there is a tendency to spare the hands, feet, and wrists. The most striking feature is the white forelock overlying a depigmented area on the scalp. This is said to be present in all but 10% to 20% of cases. When the white forelock is absent, a diagnosis is not as readily apparent. The face is usually not involved.

UROLOGY

Use of Radioactive Gold in the Treatment of Carcinoma of the Bladder: Report of Eight Cases. C. M. Nelson. South. M. J. **48:**245-250 (March) 1955 [Birmingham, Ala.].

Eight patients with bladder growths treated with radioactive gold as palliation after more conventional methods had failed are described. The amount of Au^{198} to be used was estimated from the cystoscopic appearance of the tumor and from rectal or vaginal examination. Since the gold is active only over a distance of 0.5 cm., each cubic centimeter of tissue must be injected. If the area to be treated is of large size, the bladder is opened suprapubically and as much of the tumor removed as possible. This is usually done with the electrosurgical unit, and bleeding is controlled by coagulation. A sponge is placed in the bladder to collect any spillage of radioactive material and is removed after injection. When the tumor is small enough to be handled through the cystoscope, this is passed, the tumor is excised, and the base of the tumor is fulgurated. After all

bleeding has been controlled, a ureteral catheter with a no. 26 needle shaft attached to one end and the cup to the other is passed to the tumor site, the needle is inserted into the tissue, and repeated injections are made until the entire area is treated. The effect of radioactive gold on tumor cells is lethal in the areas injected in adequate concentrations; the effect on the stroma and surrounding structures is minimal. This is shown by the rapid mucosal healing in all patients who have lived long enough to be followed. In addition, in only one patient was there any evidence of injury to contiguous structures, and in this case a portion of the intestinal irritation may well have been caused by antibiotics. There was no evidence of any generalized toxic reaction in any of these patients except in one who had both ureters transplanted and died of renal failure a month after the gold was injected, long after any radioactive effect had subsided. Au^{198} is an agent as powerful as radium, radon, or roentgen rays; it has the advantage of being more easily administered, with better localization and without adverse side-effects. It has the advantage over interstitial administration of radium in that it does not have to be removed and its activity is limited almost entirely to the area in which it is injected. It has no advantage over radon except for its greater ease of administration and the larger amounts of energy that can be given. It is not really comparable to x-rays unless the x-ray therapy is aimed at a localized lesion, in which case the short time required for the gold administration, the absence of generalized reaction, the minimal injury to surrounding structures, and the far greater amounts of energy that can be delivered to the tissues make gold the overwhelming choice.

Experience with Implantation of Radon Seeds for Bladder Tumors: Comparison of Results with Other Forms of Treatment. J. L. Emmett and J. R. Winterringer. J. Urol. **73**:502-515 (March) 1955 [Baltimore].

Emmett and Winterringer made a study of 118 cases in which radon seeds were implanted for bladder tumor at the Mayo Clinic. The tumors were of comparable "severity" or "lethal potential" to those treated by total or partial cystectomy in the Mayo Clinic series reported by McDonald and Thompson in 1948. In three-fourths of the cases the radon was implanted cystoscopically. In approximately three-fourths some type of partial removal or fulguration of the tumor (either cystoscopically or suprapubically) was carried out in addition to the implantation of radon. In slightly more than half of the cases, some x-ray therapy also was given, although in most cases only a low palliative dose was administered. The authors were surprised with the results of this radon treatment. Although 46% of patients did not survive the first year, 29% of 115 who were traced survived five years or more, which is approximately the same percentage of five year survival reported for total and partial cystectomy by McDonald and Thompson in 1948. In the large majority of cases, recurrences or the presence of uncontrolled tumor became apparent within the first two years (most within the first year). A patient surviving two years without recurrence has an excellent chance to survive five years or more. Postradiation cystitis was not a troublesome complication. Patients who survived five years or more appeared to be comfortable and well "controlled" as far as bladder function was concerned. As a result of this study, the authors are inclined to feel that the combined treatment of transurethral removal plus implantation of radon seeds may merit more frequent use than it has been accorded in the past.

Partial Resection of Kidney for Tuberculosis. J. K. Lattimer. J. Urol. **73**:455-459 (March) 1955 [Baltimore].

In the years before streptomycin was available a calcified tuberculous lesion was occasionally excised inadvertently in the belief that it was a stone in a calyx. This mishap was often followed by a urinary fistula or a tuberculous wound infection, and occasionally it resulted in a miliary spread, with death of the patient. With the advent of effective antituberculosis chemotherapy, partial nephrectomy for renal tuberculosis has been carried out under the protection of antituberculous drugs. Lattimer performs this operation on patients whose tuberculosis proved refractory to streptomycin. His surgical technique differs from the "wedge" type of resection in that he cuts the kidney off squarely, well below the infected area, leaving no flaps of tissue that might become necrotic and thus act as culture media for any residual Mycobacterium tuberculosis. It is his practice to first slit the capsule over the involved pole of the kidney and strip it well back. In this way the indentations, scars, or caseous areas that mark the tuberculous lesions can be seen and the line of excision placed well proximal to them. Exact localization of the tuberculous kidney lesion has been determined fairly accurately beforehand from multiple retrograde and intravenous pyelograms. Their location can be verified after the kidney capsule is stripped back, exposing the surface of the kidney. Chemotherapy for tuberculosis is started four months before partial nephrectomy, is intensified on the day of operation, and is continued for an additional eight months after the operation, in order to complete at least one year of combined chemotherapy. The chemotherapeutic program that is employed, as of 1954, consists of streptomycin, 1.0 gm. twice weekly; isoniazid, 100 mg. three times a day; and sodium *p*-aminosalicylic acid (PAS), 5 gm. three times a day. Medical treatment of kidney tuberculosis, even of large cavitary lesions, has now become so effective that it has sharply curtailed the author's surgical program of partial nephrectomies, at least temporarily. He had assembled some 30 patients that were suitable candidates for partial nephrectomy in that the disease was limited to one segment of the kidney. He operated upon five of these patients in rapid succession and was prepared to go on to the others when he discovered that in all of the other 25 the urine cultures had been freed of tubercle bacilli by one year of chemotherapy. He is now waiting to see whether there will be relapses before proceeding with the partial nephrectomy. Partial resection of the kidney for tuberculosis is entirely practical, should chemotherapy fail.

Treatment of Tuberculosis of Genito-Urinary Organs by Drugs. A. L. Dean. J. Urol. **73**:599-608 (March) 1955 [Baltimore].

The treatment of tuberculosis of the genitourinary organs with antibiotics and chemotherapy is based principally on the experience of the Research Unit for Genito-Urinary Tuberculosis, Veterans Administration Hospital, Bronx, N. Y. Patients with every type of tuberculosis of the genitourinary organs were treated. Diagnosis required either the identification of tubercle bacilli in a culture of the urine or tuberculous lesions in guinea pigs inoculated with the urine. During treatment, cultures were made every four months of nine consecutive 24-hour urine specimens. After treatment, cultures were made every six months. When cystoscopic examinations were made, the findings were sketched life size on a chart and compared. At each cystoscopy, cultures were made of urine from each ureter. Cultures were made of the bladder urine to show secondary invading organisms, and counts were made of the pus cells in ureteral specimens. At the same time, the bladder capacity was measured. Every two weeks, laboratory tests were performed. The ureters were catheterized every four months during treatment to guard against stricture formation. The streptomycin sensitivity of each culture was measured. These procedures have been continued since December, 1946, without interruption. Streptomycin, given alone in intramuscular doses of 1.8 gm. daily for 120 days to patients with tuberculosis of the genitourinary organs, produced relief of symptoms and clearing of tubercle bacilli from the urine in 80%. A year later, 62% remained well. However, all patients who were given 1.8 gm. of streptomycin daily suffered permanent loss of vestibular function after about 30 days, and bacterial resistance to the drug soon developed. Smaller doses and shorter treatment periods reduced these complications, but the benefits from treatment were diminished. *p*-Aminosalicylic acid in doses of 3 gm. four times a day permits the streptomycin to be reduced to 1.0 gm. twice weekly. This combined treatment, continued for a year, produced therapeutic results with no serious complications. Symptoms promptly subsided, general health improved, organisms and leukocytes disappeared from the urine, and serial pyelograms showed arrest of the lesions. Relapse was most likely to occur in patients with lesions sufficiently extensive to produce visible deformities of the renal pelvis or calices. If relapse occurs, the patient should resume treatment for at least another year. The only cure for fibrocaseous necrotic tuberculosis lesions, at present, is surgical

excision. After the disease has been controlled by prolonged drug therapy, nephrectomy is recommended for extensive, unilateral renal tuberculosis. Postoperative treatment should be given for at least six months. With the same preoperative and postoperative medical protection, tuberculous epididymides should be excised. Similarly, localized tuberculous lesions have been removed by partial nephrectomy. Isonicotinic acid hydrazid (isoniazid), has great clinical promise and has been added to the present treatment plan. This consists of a year of uninterrupted treatment with streptomycin, 1.0 gm. twice weekly, sodium *p*-aminosalicylic acid, 5 gm. three times a day, and isoniazid, 100 mg. three times a day. Although all 20 patients who received this treatment responded promptly and favorably, insufficient time has passed since treatment ended to measure the results accurately.

OPHTHALMOLOGY

Chorioretinal Burns Produced by Atomic Flash. V. A. Byrnes, D. V. L. Brown, H. W. Rose and P. A. Cibis. A. M. A. Arch. Ophth. **53**:351-364 (March) 1955 [Chicago].

The intensity of radiant energy released at detonation of an atomic bomb in the form of infrared and visible light is extremely high. It produces the well-known eclipse burn of the retina. Since this effect has been recognized from the earliest tests, the eyes of practically all observers at atomic detonations have been carefully protected by very dense filters, which transmit less than 0.5% of the visible light falling on them. The literature reveals no report of such a burn, except for a single case of bilateral central scotoma incurred in the Hiroshima atomic explosion. The main reason for the paucity of burns in the Hiroshima incident is apparent—detonation in bright sunlight with pupils of the observers constricted to small size. There were other factors also, including the size of the bomb. In this paper, which is a preliminary report, the physical factors involved and the effect of these factors on the eye are considered in the first part. The second portion gives the results obtained in an experiment using 700 rabbits in six atomic detonations in Nevada in 1953. The third portion is a brief summary of the pathological findings in these retinal burns. The animal experiments demonstrated that the danger to the retina from an atomic explosion actually exists beyond previously estimated distances. While the experiments were performed on rabbits, they show, within experimental error, agreement with estimates made. In exceptionally clear air the nominal atomic bomb (20 KT [kiloton TNT equivalents]) can be expected to produce atomic chorioretinal lesions in humans up to 36 miles in the daytime and up to 40 miles at night. Larger nuclear devices would be expected to produce them at greater distances. From the series of microscopic sections thus far studied, it can be inferred that the pigment of the retinal epithelium and choroid is the principal site of absorption of the energy from atomic flash that produces intraocular lesions. The lesions are characterized by a coagulation necrosis, accompanied by central major tissue destruction involving these same pigmented layers. The histological evolution of the tissue repair following these atomic bomb flash burns does not differ essentially from a repair following burns produced by other sources of energy. Remarkable, however, was the extensive accumulation of eosinophils in some cases. This suggests a hypersensitivity reaction to the denatured protein or its derivatives. The extent of the reactive hyperemia in the choroid surrounding the lesion was surprising. In some cases it exceeded the area of primary damage by more than six diameters. This observation suggested a study of the heat effect on the activity of certain enzymes in the retina and choroid. The clinical observation of a sharply circumscribed coagulated area in the fundus, together with the pathological finding of solid fusion of retina, choroid, and sclera, immediately suggested the use of visible and infrared radiations as potential agents in the therapy of such intraocular diseases as retinal detachments, small malignant growths, retinal cysts, and the like. Such small areas within the eye could be coagulated by the focusing of large amounts of radiant energy. Technically the procedure is entirely feasible. Radiation from a carbon arc concentrated by means of lenses will give sufficient energy per unit area.

Corticoid Therapy in Eye Diseases: Sustained Restoration of Vision in Certain Eye Diseases Considered Corticoid—Refractory or Clinically Irreversible. W. Q. Wolfson, J. R. Quinn and W. F. Spearman. A. M. A. Arch. Int. Med. **95**:400-410 (March) 1955 [Chicago].

The response to intensive long-acting corticotropin treatment, fully individualized both in dosage and in duration of therapy, was studied in 40 patients with acute eye diseases and in 36 with chronic eye diseases. Of the 40 patients, 21 with acute disorders of the milder type including acute retrobulbar neuritis, acute central angiospastic retinopathy, and acute recurrent iridocyclitis, that is, chiefly disorders with a serous inflammatory or functional vasomotor pathology, were treated for an average of 64 days with a mean 2,228 units of long-acting corticotropin. On the average, the maximum dose needed for any consecutive 10 day period was 68 units per day. Restoration of normal vision was achieved in all patients during treatment. Withdrawal of therapy was successfully accomplished without relapse in 19 patients who maintained their full improvement during an average 28-month follow-up period. Nineteen patients with more severe acute disorders of the eye, including those that are characterized by hemorrhagic, granulomatous, or necrotizing processes, received an average of 199 days therapy with a total of 6,166 units of long-acting corticotropin. The maximum dose used in any consecutive 10 days averaged 131 units per day. Fifteen (79%) of the 19 patients recovered normal or useful vision during treatment and maintained their full improvement without subsequent relapse. In 5 of these 15 recovered patients, maintenance treatment was necessary, either because of continuing activity of the eye disease or because of an extraocular corticoid-sensitive systemic disorder. In the 10 patients from whom treatment was withdrawn successfully, an average 31-month follow-up period passed without relapse. Of the 36 patients treated for chronic eye diseases, 7 had chronic anterior segment or scleral disorders, 16 disseminated chorioretinitis, 5 other inflammatory or degenerative retinal disorders, and 8 chronic retrobulbar neuritis. These patients were treated for 452 days with a total of 15,400 units of long-acting corticotropin. The average patient required 161 units per day of corticotropin for at least one 10-day period. In well over half of the patients, this maximum dosage occurred during the first 100 treatment days. The average daily dosage given during the first 100 days of treatment was 73 units per day, but after the first 100 days an average daily dose of 26 units per day was sufficient. In 28 (78%) of the 36 patients with chronic eye diseases, useful or normal vision was restored during treatment. Twenty-six of the 28 patients maintained their full improvement for an average of 20 months, but in most of these patients maintenance of improvement required continuous therapy, though at reduced dosages. In only six of the entire group of 76 patients treated for acute or chronic eye diseases, hypercorticoid manifestations required termination of therapy. Results obtained in the authors' cases showed that in certain acute disorders of the eye that have been reported to respond irregularly, incompletely, or transiently to hormonal therapy and in certain inflammatory and degenerative disorders of the eye reported not to show even an incomplete response to such treatment, intensive individualized long-term corticotropin therapy permitted most of the patients to regain normal or useful vision and, in almost all cases, to maintain their full improvement indefinitely thereafter. Certain features of the therapeutic response in chronic disorders of the optic nerve or retina are unique to this group of disorders. They suggest that, in these cases, recovery may depend on previously unknown actions of the hormones of the adrenal cortex.

Kerato-Conjunctivitis Sicca Treated with Cortisone and ACTH. S. Eadie and M. Thompson. Brit. J. Ophth. **39**:90-97 (Feb.) 1955 [London, England].

Reports on the value of cortisone or corticotropin have been conflicting, probably because most observers only treated a single case, and because in several instances only limited supplies of the hormones were available, so that treatment may have been inadequate. The authors report on 12 cases of kerato-conjunctivitis sicca treated with cortisone drops, systemically given cortisone, or corticotropin. The cortisone drops used were a 0.625% solution of cortisone acetate in a buffered base. The

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response to local cortisone therapy (0.625% solution three times daily) was generally good. For the more severe cases stronger preparations were found to be more effective, and more frequent instillation was required. Hydrocortisone eyedrops did not appear to be any more effective than cortisone, although hydrocortisone is usually considered to be more active locally. The addition of cortisone eye ointment to local therapy did not augment the therapeutic response. Cortisone presumably is effective in local treatment by virtue of direct anti-inflammatory action on the corneal and conjunctival tissues. Amelioration of symptoms and improvement of vision corresponded with reduction of vascular hyperemia and mucoid exudate. There was usually a definite decrease in the corneal filaments and staining reaction. Topical therapy did not lead to any increased lacrimal secretion as measured by Schirmer's test. Systemically given cortisone and corticotropin therapy were effective, but their use is not warranted in the treatment of this condition. Sealing the lacrimal canaliculi relieved the more severe cases, and this form of treatment is most valuable in patients who require prolonged topical cortisone or whose response is inadequate.

OTOLARYNGOLOGY

Action of Drugs Used Against Seasickness on Normal Labyrinth. E. G. Vaquero Garrido and A. Ortega García. Rev. españ. oto-neuro-oftal. **13**:324-332 (Sept.-Oct.) 1954 (In Spanish) [Valencia, Spain].

The effects of certain anti-motion-sickness drugs on the normal labyrinth of man were determined in 25 normal soldiers and parachutists. The drugs used were Vasano (hyoscyamine and scopolamine), Mareosan (atropine, belladonna, and caffeine), Pyridoxine (Vitamin B_6), and the antihistamine drugs Dramamine, Benadryl, and Phenergan. The drugs were given by mouth in the following doses: Vasano and Mareosan 2 tablets two hours before; Pyridoxine 4 tablets of 20 mg. each, two hours before; Dramamine, 1 or 2 tablets one and one-half hours before; Benadryl, 2 capsules of 50 mg. each, one or four hours before; and Phenergan, one dose of 25 mg. 45 minutes before the test. The reaction on the labyrinth of the drugs was determined by the classic thermic and rotatory tests made in both ears several hours before administration of the drugs for normal response and again one, one and one-half, two, and four hours after administration of the drugs and only in one case 45 minutes after it. Four or five persons were investigated for results of every drug. The effect of the drug on the labyrinth was interpreted by the percentage of difference in the duration of thermic and rotatory nystagmus after administration of the drugs in comparison to normal duration. The differences were less marked during the thermic than during the rotatory tests. Atropine preparations have a more marked effect on the normal labyrinth than antihistaminic drugs. The differences for Vasano and Mareosan in the thermic test were 8.75% and plus 4%, respectively, whereas in the rotatory test they were 25% and 24% respectively. Vitamin B_6 proved to have no action at all on the normal labyrinth. Dramamine showed a moderate action during the thermic test and a marked action with a difference of 20% in the rotatory test. Benadryl had no action during the thermic test and caused a difference of 11% in the rotatory test. Phenergan had a moderate action during the thermic test and caused an increased duration of plus 13% during the rotatory test. The authors conclude that the greatest activity of these drugs during the tests is that of the atropine preparations, mainly Vasano. Dramamine is the most active among antihistamine drugs. Vitamin B_6 is entirely inefficient.

Endobronchial Placer Mining for Neoplastic Cells. J. B. Gregg, B. M. Merkel and K. R. Cross. A. M. A. Arch. Otolaryng. **61**:267-276 (March) 1955 [Chicago].

The principle used in the described technique for obtaining neoplastic cells from the bronchi can be compared to the "placer" method of mining gold, in which a forceful stream of water is used to wash gold particles into a container so that they may be more easily and efficiently separated. The bronchial mucosa in the suspected area is abraded with the suction tip to separate small flecks of mucosa. The areas so treated are then irrigated with a jet of sodium chloride solution and the mixture sucked into a collecting vial. The tissue thus obtained represents minute biopsy specimens of the mucosa collected by irrigation and aspiration. Thus an increased amount of tissue is available for examination and specimens are obtained from areas not accessible to the biopsy forceps. In one year the authors performed 190 bronchoscopies on 168 patients, and 128 different cytology specimens were obtained with these examinations. During this period there were 37 patients with proved new lung tumors admitted to hospital, 31 of whom were examined by the "placer mining" method. The accuracy of the method in detecting malignant neoplasms was 63%; only five patients were referred to the bronchoscopy clinic because no evidence of the lesion could be seen or the aspirated specimen was not diagnostic. Thus the method was helpful in 80% of the patients examined. The best results with this technique are obtained in endobronchial lesions, which in the authors' patients to date have been mostly epidermoid carcinomas. The peripherally located tumors and the parenchymal lesions are less frequently diagnosed with any cytological method, probably because of the smaller number of exfoliated neoplastic cells. However, by "placer mining" it is possible to increase the number of neoplastic cell clumps in the specimen and achieve more positive results. It has been shown that the epidermoid group of lung tumors, usually located within the bronchi or within the mucosa of the bronchi, is increasing in number, while the adenocarcinoma group remains about the same statistically. For this reason it is important that early diagnosis of the endobronchial lesions be promoted. The "placer mining" method of obtaining neoplastic tissue offers a greater chance of securing abnormal cells than does simple aspiration of mucus from the bronchial lumen. This method of examination can be carried out in the pathology department of any hospital without the addition of new techniques, with existing equipment and supplies, and with only a slight increase in the work load of current personnel.

THERAPEUTICS

The Value of Parenteral Reserpine in Acute Hypertension. F. A. Finnerty Jr. and J. G. Sites. Am. J. M. Sc. **229**:379-385 (April) 1955 [Philadelphia].

Reserpine in doses of 2.5 mg. was given intravenously to 162 obstetric patients with acute hypertension caused by toxemia of pregnancy or hypertensive vascular disease. When, after two hours, reserpine was observed to be ineffective or the toxemic state seemed to require more vigorous therapy, 47 patients received reserpine intravenously and in addition a synthetic Veratrum viride alkaloid preparation (Unitensen) intramuscularly, and 24 patients received reserpine and hydralazine (Apresoline) hydrochloride intravenously. Ninety-one patients were treated with reserpine alone and showed an average reduction of 23 mm. Hg in systolic pressure and 19 mm. Hg in diastolic pressure, an effect that lasted an average of six and a half hours. More striking than the hypotensive effect was the calming influence of the drug, with frequent complete relief of anxiety. Seventy-one patients required the addition of Veratrum viride or hydralazine to bring about a satisfactory response. Though reserpine did not significantly enhance the hypotensive effect of Veratrum, it more than doubled the duration of response, permitting less Veratrum to be used, thus making Veratrum easier to administer, more effective, and less toxic. Reserpine enhanced the hypotensive effect and prolonged the action of hydralazine hydrochloride, permitting the use of smaller doses of hydralazine hydrochloride, which significantly reduced its side-effects. Thirty nonpregnant hypertensive patients were given 2.5 mg. of reserpine intramuscularly. The response was almost identical with that seen following the intravenous use of the drug. In 26 of the 30 patients the systolic blood pressure was reduced an average of 20 mm. Hg and the diastolic pressure was reduced an average of 19 mm. Hg; four patients in the malignant phase of hypertension failed to show a blood pressure reduction. As with reserpine given orally, the greatest usefulness of the drug given parenterally is with the more potent and toxic hypotensive agents where it is used as a background agent, making these latter drugs more effective, less toxic, and easier to administer. A rational plan of therapy for acute hypertension in the moderately sick patient should include, first, 2.5 mg. of reserpine

intramuscularly to be repeated every 12 hours. Second, if no hypotensive effect is obtained in two hours, or if any worsening of the clinical state should occur, 0.5 mg. of purified Veratrum should be given intramuscularly. In the severely ill patient with acute hypertension, reserpine and Veratrum or hydralazine hydrochloride should be administered at once, preferably in the same syringe. If no effect from combined intramuscular therapy is witnessed, then intravenous administration of Veratrum or hydralazine hydrochloride is indicated.

Trial of a Product: Combined Vitamin B_{12} and Penicillin. J. Gouyen and R. Bouvier. Semaine hôp. Paris **31:**975-977 (March 14) 1955 (In French) [Paris, France].

A product in tablet form, each tablet containing 200 gammas of vitamin B_{12} and 200,000 units of penicillin, was studied to determine its clinical effect on infants and children suffering from weakness, hypotrophy, and anorexia, or convalescing from various illnesses. No other therapy was given during the trial period, and no changes were made in the subjects' usual diet. The treatment was never given during the course of an illness, and, when it was given during convalescence after an infection, some time was allowed to elapse between the end of the illness and the time therapy was started. The children, who ranged in age from 2 months to 8 years, all had negative tuberculin skin reactions and normal urinalyses. Dosage generally consisted of ½ tablet daily for children up to 1 year; 1 tablet daily for those from 1 to 5; and 2 tablets daily for those over 5. Two groups were treated, the first consisting of 18 weak, hypotrophic, anorectic children and the other of 12 who were convalescing from measles (2), whooping cough (3), infectious stomatitis (2), and various other conditions (1 each). The factors considered in evaluating the efficacy of the medication and in judging the results obtained by its administration were, primarily, the patient's weight curve and, secondarily, his appetite and appearance. All but one of the children tolerated the product perfectly, and two-thirds of them were unquestionably improved in weight, appetite, and general condition. The rapidity with which these gains were made in the convalescent group further indicated the value of this combination of vitamin B_{12} and penicillin.

Possibilities and Limitations of P^{32}-Therapy of Malignant Tumors. H. R. Renfer. Schweiz. med. Wchnschr. **85:**258-261 (March 12) 1955 (In German) [Basel, Switzerland].

Between 1950 and 1953, 26 patients with malignant tumors were treated with radioactive phosphorus at the roentgen institute of the University of Bern. Fifteen patients had generalized lymphosarcoma and reticulosarcoma, 2 metastasizing mixed renal tumors, 2 carcinomas with generalized metastasis, 1 far-advanced sympathogonioma, 1 medulloblastoma, and 2 radiosensitive metastasizing tumors without microscopic verification. The remaining three patients had extensive primary tumors and were given prophylactic treatment with radioactive phosphorus in addition to external irradiation of the primary tumor. High single doses of radioactive phosphorus were used in most patients. The average dose of 5.1 mc. corresponded to 77 rep per gram of body tissue in one and a half months; 14 patients received one single massive treatment with an average dose of 4.9 mc., i. e., 62 rep per gram of body tissue. Treatment with radioactive phosphorus was not continued in patients with conditions refractory to the first dose of 5 mc. on the average. Nine (34%) of the 26 patients showed a response that consisted of temporary freedom from symptoms or temporary improvement. Temporary freedom from symptoms resulted in one patient with a generalized small cell-round cell sarcoma, in one patient with lymphosarcoma, and in a juvenile person with a highly sensitive renal mixed tumor. In the patient with sympathogonioma and with diffuse skeletal and soft tissue metastases, the size of the enlarged liver diminished and severe skeletal pain subsided for six weeks. Results were unfavorable in patients in the terminal phase of the disease and with bad general condition. The only essential complication consisted of thrombopenic purpura in three patients who received the highest activities with 101 rep per gram of body tissue in one month, 182 rep per gram of body tissue in four months, and 230 rep per gram of body tissue in four months, respectively. All three patients were in the terminal phase of the disease with generalized diffuse and particularly skeletal metastases; they had received the maximum irradiation load per body weight unit, and it may be assumed that the bone marrow tolerance was exceeded. Transitory leukopenia in various degrees and reduced thrombopoiesis resulted from the treatment in 17 patients. The hematopoietic complications seem to be related to the irradiation load per gram of body tissue and the duration of the treatment, since already 90 rep per gram of body tissue within one month can bring about a serious condition, while with a four months' duration of treatment the critical tissue dose seems to be 170 rep per gram of body tissue. On this basis it should be possible to make the best use of radioactive phosphorus treatment without the risk of serious hemopoietic complications. The author's therapeutic results corresponded with those reported by other workers and suggest that success may be expected only in tumors that are highly sensitive to irradiation, such as lymphosarcoma, reticulosarcoma with lymphoid cells, large follicular lymphoblastoma, and possibly small cell bronchial carcinoma, sympathogonioma, and certain forms of seminoma. "Prophylactic treatment" is indicated in cases of radiosensitive primary tumors if it seems highly probable that distal metastases have begun to develop.

Exchange Blood Transfusion in Toxicology. A. I. Calabrese, M. P. Francone, F. H. Mariani and C. Guerra. Rev. Asoc. méd. argent. **68:**530-536 (Nov. 15-30) 1954 (In Spanish) [Buenos Aires, Argentina].

The authors practiced exchange blood transfusion in acute barbiturate or carbon monoxide intoxication in 10 adults and in acute alcohol intoxication in a child 4 years old. The treatment consisted of removal of 1,000 cc. and transfusion of 1,500 cc. of blood only once, or bleeding of 400 cc. and transfusion of 800 cc. of blood done twice or three times at intervals of 8 to 10 hours. The patients were observed at a period of time that varied between 1½ and 76 hours after ingestion of the toxic substance or occurrence of intoxication. The amount of barbiturate preparations (sodium amytal, nembutal, luminal, or sodium veronal) taken by the patients varied between 4 and 25 gm. The patients were in deep coma. The seven patients with acute barbiturate intoxication and the three patients with acute carbon monoxide intoxication came out of coma more or less rapidly after administration of the treatment. Five patients with acute barbiturate intoxication and two with acute monoxide intoxication got well. The remaining three patients died with cardiac and/or bronchopulmonary complications. The child rapidly improved to complete recovery after a gastric lavage, cardiotonics, and an exchange blood transfusion of 300 cc. Exchange blood transfusion with large amounts is of great value in acute intoxications. It detoxicates the patient by eliminating the toxic substances from the blood and the tissues, prevents or relieves venous stasis, congestion, edema of the tissues and of the lung, and anoxia of the myocardium. Transfusion replaces oxyhemoglobin and restores to normal the composition and volume of the blood. The treatment is also indicated in intoxication by certain metals, metaloids, alkaloids of slow absorption, methemoglobinemic and hemolytic substances, oxalic acid, and acute mercurial intoxication with uremia.

PATHOLOGY

Some Morphological and Enzymatic Alterations Induced in the Kidney by Alloxan and Cortisone. G. Avezzú, F. Fiaccadori, and L. Scarponi. Gior. clin. med. **35:**1551-1577 (Dec.) 1954 (In Italian) [Bologna, Italy].

The authors performed a series of experiments on 75 guinea pigs in an attempt to determine whether specific lesions can be produced by alloxan in the renal parenchyma; whether there is a parallelism between the morphological findings and the enzymatic changes of the involved tissue, with particular reference to alkaline and acid dehydrogenase and phosphatase; and whether cortisone can change the histological and functional lesions caused by alloxan. The following conclusions were reached. 1. The action of alloxan induced marked morphological renal lesions, which in some instances assumed the aspect of disseminated foci of tubular necrosis. The extension and severity of these lesions depended always on the dose admin-

istered, and, because the guinea pig is less sensitive than other animals to the diabetes-inducing action of alloxan, it does not seem probable that the substance acted because of its diabetes-inducing power. 2. Alloxan caused a decrease in the alkaline dehydrogenase and phosphatase power of the kidney. 3. Administration of cortisone in large doses of 10 mg. daily for three days lowered slightly the alkaline phosphatase of the renal tissue without however modifying the acid dehydrogenase and phosphatase. Administration of 25 mg. daily of the hormone for about four days also left the acid phosphatase unchanged but caused a marked increase (25% about) in the activity of the alkaline phosphatase and the dehydrogenase power. 4. Administration of 10 mg. of cortisone for three days followed by that of alloxan induced morphological changes that were much more severe than those produced by alloxan alone, and there was also a marked decrease in all the afore-mentioned enzymatic powers. Administration of 25 mg. of the hormone for four days followed by that of alloxan induced histological and enzymatic changes very much like those produced in the previous group but the dehydrogenase activity was not altered. Hypotheses are advanced to explain the results obtained.

Tobacco and Carbon Monoxide. L. Binet and M. Bochet. Presse méd. **63**:283-284 (Feb. 26) 1955 (In French) [Paris, France].

A cigarette smoking apparatus was devised by the authors, in which smoke from a cigarette smoked over a six minute period was collected in a bell jar. When birds were placed in the jar, whether right after the cigarette had been smoked or not until after the smoke had cleared from the jar, collapse, convulsions, and death occurred within two minutes. Attempts with the administration of oxygen to revive the birds after exposure were unsuccessful in all cases, though temporarily successful in two. It is concluded from this study that smokers fill the air around them not only with nicotine but also with carbon monoxide. They should be encouraged to smoke outdoors or with a window open.

Needle Necropsy. R. Terry. J. Clin. Path. **8**:38-41 (Feb.) 1955 [London, England].

According to Terry it is possible to obtain adequate diagnostic postmortem specimens with a needle. The instrument is essentially like that used in needle biopsy of the liver, but it has a modified needle of a larger bore. It consists of a 20 ml. syringe adapted to carry a 3 mm. (internal diameter) needle, 15 cm. long, on the barrel and a trocar on the piston. The point of the needle is notched and sharpened to ensure that it cuts into the tissue. A bevelled point has been discarded, since it is blunted by hard tissue and fails to obtain specimens from spongy tissue. The trocar has a cutting point that projects 1 cm. beyond the needle: it is flattened along one side so that pressures within the syringe, positive or negative, are transmitted down the needle to the specimen. Needle necropsy can be performed at the bedside as easily as in the mortuary. Several labeled test-tubes containing fixative are necessary for the specimens. The danger of personal injury with the needle, especially in cases of infection, must be borne in mind. The specimen is obtained by a movement opposite to that used in aspirating fluid with a syringe: the left hand holds the plunger stationary, while the right hand thrusts the syringe barrel forward and so advances the needle into the tissue. The specimen is held by the negative pressure in the syringe, but it is still attached at its distal end. This attachment is broken by further withdrawing the plunger to stretch the specimen and then rotating the whole instrument several times. On removing the instrument, the specimen remains in the needle and is prevented by the trocar from being sucked up into the syringe. Specimens from different sites are placed in separate labeled test-tubes. Needle necropsy is impossible in generalized infections, peptic ulceration and its complications, intestinal perforation and obstruction, vascular disasters, and some cardiac conditions. In general terms, needle necropsy is most likely to be successful when there is a mass or enlarged viscus. The brain may sometimes be approached through the foramen magnum, the orbit, or the foramen ovale; it is, however, much simpler to drill a small hole in the skull directly over the suspected area. Meningitis, encephalitis, cerebral tumors, and sometimes vascular disease may be diagnosed. The thorax is easily accessible through the intercostal spaces. Specimens from the lungs may reveal pneumonia, phthisis, silicosis, and bronchial carcinoma, while the nature of mediastinal masses and sometimes of cardiac disease may be ascertained. The abdomen is a rich field for needle necropsy, with the liver yielding particularly good results. In a series of 24 needle necropsies performed by the author only two failed to permit a diagnosis. He concludes that the method is a valuable alternative to formal postmortem examination.

Comparison of Human and Sheep Blood Agar in Detecting Streptococcus: Observations in Acute Tonsillitis and Pharyngitis. W. F. Nuessle, D. E. Wright and P. R. Jones. U. S. Armed Forces M. J. **6**:320-323 (March) 1955 [Washington, D. C.].

In a study of the causative organisms of tonsillitis and pharyngitis in patients admitted to an Air Force hospital, observations were first made on, and data collected from, 135 men admitted with these conditions in the three month period from September through November, 1953. Bacterial cultures were performed on admission by streaking a pharyngeal swab over human blood agar plates. These plates were prepared by using donor blood that had reached the expiration date, usually three to four weeks. Streptococcus viridans or Str. pyogenes was usually obtained. The following is the frequency of occurrence of each organism: Str. pyogenes, 51; Str. viridans, 40; Str. pyogenes and Str. viridans, 26; Diplococcus pneumoniae, 9; nonhemolytic streptococci, 5; and Micrococcus pyogenes, 4. Str. pyogenes was found in a total of 77 instances. There was little difference in those showing various bacteria in regard to fever, exudate, glandular enlargement, or duration of illness. It was then suggested that sheep blood be substituted for human blood in preparation of plates. Sheep blood plates were accordingly prepared similarly to the human plates, except that the blood was fresh, and 135 cultures were obtained from consecutive adult male patients admitted with acute tonsillitis and pharyngitis in an 11 week period beginning in February, 1954. Str. pyogenes was obtained in every instance. This organism predominated in all but 13 cultures when only scattered colonies were found. It was at times associated with Str. viridans and in six instances with M. pyogenes. To determine the difference between human and sheep blood agar plates in detecting Str. pyogenes, throat swabs from each of 20 patients were streaked on both types of medium. Only 10 of the 20 human blood plates showed Str. pyogenes, but the sheep blood plates revealed it in every instance. Clinical comparison of the 135 subjects tested on human blood agar (group 1) and those on sheep blood agar (group 2) revealed no essential difference. The age distribution, presence of exudate, degree and duration of fever, total and differential white blood cell count, presence of tonsillar hypertrophy or cervical node enlargement, and duration of hospitalization were similar in both groups. In commenting on the fact that Str. pyogenes was found in a larger number of patients on streaked sheep blood agar plates than on human blood, the authors say that sheep blood is recommended by some investigators for culturing streptococci. It is suggested that there may be a factor in human blood which inhibits growth and hemolysis of Str. pyogenes. This theoretically could be antistreptolysin, which is apparently present in high titer in the blood of persons from areas where streptococcic diseases are endemic.

Effects of Ovariectomy on Experimental Atherosclerosis in Rabbits. G. Mininni, S. Contro and C. Checchia. Circulation Res. **3**:191-193 (March) 1955 [New York].

Twenty-nine female rabbits of the same strain and of the same age and weight, 14 of which had been surgically castrated, exhibited the following findings in response to a cholesterol-supplemented diet (0.5 gm. of cholesterol in 5 cc. of olive oil daily) fed for 50 days: similar patterns of feed intake and weight gain, more marked hypercholesterolemia in the group of animals whose ovaries had been removed, and more marked aortic and coronary atherogenesis in the intact animals. On microscopic examination, all the hearts but one were found to have coronary lesions. In accord with the aortic findings, the group with ovariectomy had significantly lower grades of coronary lesions. In most animals of both groups, lesions consisted of subendo-

intramuscularly to be repeated every 12 hours. Second, if no hypotensive effect is obtained in two hours, or if any worsening of the clinical state should occur, 0.5 mg. of purified Veratrum should be given intramuscularly. In the severely ill patient with acute hypertension, reserpine and Veratrum or hydralazine hydrochloride should be administered at once, preferably in the same syringe. If no effect from combined intramuscular therapy is witnessed, then intravenous administration of Veratrum or hydralazine hydrochloride is indicated.

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A product in tablet form, each tablet containing 200 gammas of vitamin B_{12} and 200,000 units of penicillin, was studied to determine its clinical effect on infants and children suffering from weakness, hypotrophy, and anorexia, or convalescing from various illnesses. No other therapy was given during the trial period, and no changes were made in the subjects' usual diet. The treatment was never given during the course of an illness, and, when it was given during convalescence after an infection, some time was allowed to elapse between the end of the illness and the time therapy was started. The children, who ranged in age from 2 months to 8 years, all had negative tuberculin skin reactions and normal urinalyses. Dosage generally consisted of ½ tablet daily for children up to 1 year; 1 tablet daily for those from 1 to 5; and 2 tablets daily for those over 5. Two groups were treated, the first consisting of 18 weak, hypotrophic, anorectic children and the other of 12 who were convalescing from measles (2), whooping cough (3), infectious stomatitis (2), and various other conditions (1 each). The factors considered in evaluating the efficacy of the medication and in judging the results obtained by its administration were, primarily, the patient's weight curve and, secondarily, his appetite and appearance. All but one of the children tolerated the product perfectly, and two-thirds of them were unquestionably improved in weight, appetite, and general condition. The rapidity with which these gains were made in the convalescent group further indicated the value of this combination of vitamin B_{12} and penicillin.

Possibilities and Limitations of P^{32}-Therapy of Malignant Tumors. H. R. Renfer. Schweiz. med. Wchnschr. **85:**258-261 (March 12) 1955 (In German) [Basel, Switzerland].

Between 1950 and 1953, 26 patients with malignant tumors were treated with radioactive phosphorus at the roentgen institute of the University of Bern. Fifteen patients had generalized lymphosarcoma and reticulosarcoma, 2 metastasizing mixed renal tumors, 2 carcinomas with generalized metastasis, 1 far-advanced sympathogonioma, 1 medulloblastoma, and 2 radiosensitive metastasizing tumors without microscopic verification. The remaining three patients had extensive primary tumors and were given prophylactic treatment with radioactive phosphorus in addition to external irradiation of the primary tumor. High single doses of radioactive phosphorus were used in most patients. The average dose of 5.1 mc. corresponded to 77 rep per gram of body tissue in one and a half months; 14 patients received one single massive treatment with an average dose of 4.9 mc., i. e., 62 rep per gram of body tissue. Treatment with radioactive phosphorus was not continued in patients with conditions refractory to the first dose of 5 mc. on the average. Nine (34%) of the 26 patients showed a response that consisted of temporary freedom from symptoms or temporary improvement. Temporary freedom from symptoms resulted in one patient with a generalized small cell-round cell sarcoma, in one patient with lymphosarcoma, and in a juvenile person with a highly sensitive renal mixed tumor. In the patient with sympathogonioma and with diffuse skeletal and soft tissue metastases, the size of the enlarged liver diminished and severe skeletal pain subsided for six weeks. Results were unfavorable in patients in the terminal phase of the disease and with bad general condition. The only essential complication consisted of thrombopenic purpura in three patients who received the highest activities with 101 rep per gram of body tissue in one month, 182 rep per gram of body tissue in four months, and 230 rep per gram of body tissue in four months, respectively. All three patients were in the terminal phase of the disease with generalized diffuse and particularly skeletal metastases; they had received the maximum irradiation load per body weight unit, and it may be assumed that the bone marrow tolerance was exceeded. Transitory leukopenia in various degrees and reduced thrombopoiesis resulted from the treatment in 17 patients. The hematopoietic complications seem to be related to the irradiation load per gram of body tissue and the duration of the treatment, since already 90 rep per gram of body tissue within one month can bring about a serious condition, while with a four months' duration of treatment the critical tissue dose seems to be 170 rep per gram of body tissue. On this basis it should be possible to make the best use of radioactive phosphorus treatment without the risk of serious hemopoietic complications. The author's therapeutic results corresponded with those reported by other workers and suggest that success may be expected only in tumors that are highly sensitive to irradiation, such as lymphosarcoma, reticulosarcoma with lymphoid cells, large follicular lymphoblastoma, and possibly small cell bronchial carcinoma, sympathogonioma, and certain forms of seminoma. "Prophylactic treatment" is indicated in cases of radiosensitive primary tumors if it seems highly probable that distal metastases have begun to develop.

Exchange Blood Transfusion in Toxicology. A. I. Calabrese, M. P. Francone, F. H. Mariani and C. Guerra. Rev. Asoc. méd. argent. **68:**530-536 (Nov. 15-30) 1954 (In Spanish) [Buenos Aires, Argentina].

The authors practiced exchange blood transfusion in acute barbiturate or carbon monoxide intoxication in 10 adults and in acute alcohol intoxication in a child 4 years old. The treatment consisted of removal of 1,000 cc. and transfusion of 1,500 cc. of blood only once, or bleeding of 400 cc. and transfusion of 800 cc. of blood done twice or three times at intervals of 8 to 10 hours. The patients were observed at a period of time that varied between 1½ and 76 hours after ingestion of the toxic substance or occurrence of intoxication. The amount of barbiturate preparations (sodium amytal, nembutal, luminal, or sodium veronal) taken by the patients varied between 4 and 25 gm. The patients were in deep coma. The seven patients with acute barbiturate intoxication and the three patients with acute carbon monoxide intoxication came out of coma more or less rapidly after administration of the treatment. Five patients with acute barbiturate intoxication and two with acute monoxide intoxication got well. The remaining three patients died with cardiac and/or bronchopulmonary complications. The child rapidly improved to complete recovery after a gastric lavage, cardiotonics, and an exchange blood transfusion of 300 cc. Exchange blood transfusion with large amounts is of great value in acute intoxications. It detoxicates the patient by eliminating the toxic substances from the blood and the tissues, prevents or relieves venous stasis, congestion, edema of the tissues and of the lung, and anoxia of the myocardium. Transfusion replaces oxyhemoglobin and restores to normal the composition and volume of the blood. The treatment is also indicated in intoxication by certain metals, metaloids, alkaloids of slow absorption, methemoglobinemic and hemolytic substances, oxalic acid, and acute mercurial intoxication with uremia.

PATHOLOGY

Some Morphological and Enzymatic Alterations Induced in the Kidney by Alloxan and Cortisone. G. Avezzú, F. Fiaccadori, and L. Scarponi. Gior. clin. med. **35:**1551-1577 (Dec.) 1954 (In Italian) [Bologna, Italy].

The authors performed a series of experiments on 75 guinea pigs in an attempt to determine whether specific lesions can be produced by alloxan in the renal parenchyma; whether there is a parallelism between the morphological findings and the enzymatic changes of the involved tissue, with particular reference to alkaline and acid dehydrogenase and phosphatase; and whether cortisone can change the histological and functional lesions caused by alloxan. The following conclusions were reached. 1. The action of alloxan induced marked morphological renal lesions, which in some instances assumed the aspect of disseminated foci of tubular necrosis. The extension and severity of these lesions depended always on the dose admin-

istered, and, because the guinea pig is less sensitive than other animals to the diabetes-inducing action of alloxan, it does not seem probable that the substance acted because of its diabetes-inducing power. 2. Alloxan caused a decrease in the alkaline dehydrogenase and phosphatase power of the kidney. 3. Administration of cortisone in large doses of 10 mg. daily for three days lowered slightly the alkaline phosphatase of the renal tissue without however modifying the acid dehydrogenase and phosphatase. Administration of 25 mg. daily of the hormone for about four days also left the acid phosphatase unchanged but caused a marked increase (25% about) in the activity of the alkaline phosphatase and the dehydrogenase power. 4. Administration of 10 mg. of cortisone for three days followed by that of alloxan induced morphological changes that were much more severe than those produced by alloxan alone, and there was also a marked decrease in all the afore-mentioned enzymatic powers. Administration of 25 mg. of the hormone for four days followed by that of alloxan induced histological and enzymatic changes very much like those produced in the previous group but the dehydrogenase activity was not altered. Hypotheses are advanced to explain the results obtained.

Tobacco and Carbon Monoxide. L. Binet and M. Bochet. Presse méd. **63**:283-284 (Feb. 26) 1955 (In French) [Paris, France].

A cigarette smoking apparatus was devised by the authors, in which smoke from a cigarette smoked over a six minute period was collected in a bell jar. When birds were placed in the jar, whether right after the cigarette had been smoked or not until after the smoke had cleared from the jar, collapse, convulsions, and death occurred within two minutes. Attempts with the administration of oxygen to revive the birds after exposure were unsuccessful in all cases, though temporarily successful in two. It is concluded from this study that smokers fill the air around them not only with nicotine but also with carbon monoxide. They should be encouraged to smoke outdoors or with a window open.

Needle Necropsy. R. Terry. J. Clin. Path. **8**:38-41 (Feb.) 1955 [London, England].

According to Terry it is possible to obtain adequate diagnostic postmortem specimens with a needle. The instrument is essentially like that used in needle biopsy of the liver, but it has a modified needle of a larger bore. It consists of a 20 ml. syringe adapted to carry a 3 mm. (internal diameter) needle, 15 cm. long, on the barrel and a trocar on the piston. The point of the needle is notched and sharpened to ensure that it cuts into the tissue. A bevelled point has been discarded, since it is blunted by hard tissue and fails to obtain specimens from spongy tissue. The trocar has a cutting point that projects 1 cm. beyond the needle; it is flattened along one side so that pressures within the syringe, positive or negative, are transmitted down the needle to the specimen. Needle necropsy can be performed at the bedside as easily as in the mortuary. Several labeled test-tubes containing fixative are necessary for the specimens. The danger of personal injury with the needle, especially in cases of infection, must be borne in mind. The specimen is obtained by a movement opposite to that used in aspirating fluid with a syringe: the left hand holds the plunger stationary, while the right hand thrusts the syringe barrel forward and so advances the needle into the tissue. The specimen is held by the negative pressure in the syringe, but it is still attached at its distal end. This attachment is broken by further withdrawing the plunger to stretch the specimen and then rotating the whole instrument several times. On removing the instrument, the specimen remains in the needle and is prevented by the trocar from being sucked up into the syringe. Specimens from different sites are placed in separate labeled test-tubes. Needle necropsy is impossible in generalized infections, peptic ulceration and its complications, intestinal perforation and obstruction, vascular disasters, and some cardiac conditions. In general terms, needle necropsy is most likely to be successful when there is a mass or enlarged viscus. The brain may sometimes be approached through the foramen magnum, the orbit, or the foramen ovale; it is, however, much simpler to drill a small hole in the skull directly over the suspected area. Meningitis, encephalitis, cerebral tumors, and sometimes vascular disease may be diagnosed. The thorax is easily accessible through the intercostal spaces. Specimens from the lungs may reveal pneumonia, phthisis, silicosis, and bronchial carcinoma, while the nature of mediastinal masses and sometimes of cardiac disease may be ascertained. The abdomen is a rich field for needle necropsy, with the liver yielding particularly good results. In a series of 24 needle necropsies performed by the author only two failed to permit a diagnosis. He concludes that the method is a valuable alternative to formal postmortem examination.

Comparison of Human and Sheep Blood Agar in Detecting Streptococcus: Observations in Acute Tonsillitis and Pharyngitis. W. F. Nuessle, D. E. Wright and P. R. Jones. U. S. Armed Forces M. J. **6**:320-323 (March) 1955 [Washington, D. C.].

In a study of the causative organisms of tonsillitis and pharyngitis in patients admitted to an Air Force hospital, observations were first made on, and data collected from, 135 men admitted with these conditions in the three month period from September through November, 1953. Bacterial cultures were performed on admission by streaking a pharyngeal swab over human blood agar plates. These plates were prepared by using donor blood that had reached the expiration date, usually three to four weeks. Streptococcus viridans or Str. pyogenes was usually obtained. The following is the frequency of occurrence of each organism: Str. pyogenes, 51; Str. viridans, 40; Str. pyogenes and Str. viridans, 26; Diplococcus pneumoniae, 9; nonhemolytic streptococci, 5; and Micrococcus pyogenes, 4. Str. pyogenes was found in a total of 77 instances. There was little difference in those showing various bacteria in regard to fever, exudate, glandular enlargement, or duration of illness. It was then suggested that sheep blood be substituted for human blood in preparation of plates. Sheep blood plates were accordingly prepared similarly to the human plates, except that the blood was fresh, and 135 cultures were obtained from consecutive adult male patients admitted with acute tonsillitis and pharyngitis in an 11 week period beginning in February, 1954. Str. pyogenes was obtained in every instance. This organism predominated in all but 13 cultures when only scattered colonies were found. It was at times associated with Str. viridans and in six instances with M. pyogenes. To determine the difference between human and sheep blood agar plates in detecting Str. pyogenes, throat swabs from each of 20 patients were streaked on both types of medium. Only 10 of the 20 human blood plates showed Str. pyogenes, but the sheep blood plates revealed it in every instance. Clinical comparison of the 135 subjects tested on human blood agar (group 1) and those on sheep blood agar (group 2) revealed no essential difference. The age distribution, presence of exudate, degree and duration of fever, total and differential white blood cell count, presence of tonsillar hypertrophy or cervical node enlargement, and duration of hospitalization were similar in both groups. In commenting on the fact that Str. pyogenes was found in a larger number of patients on streaked sheep blood agar plates than on human blood, the authors say that sheep blood is recommended by some investigators for culturing streptococci. It is suggested that there may be a factor in human blood which inhibits growth and hemolysis of Str. pyogenes. This theoretically could be antistreptolysin, which is apparently present in high titer in the blood of persons from areas where streptococcic diseases are endemic.

Effects of Ovariectomy on Experimental Atherosclerosis in Rabbits. G. Mininni, S. Contro and C. Checchia. Circulation Res. **3**:191-193 (March) 1955 [New York].

Twenty-nine female rabbits of the same strain and of the same age and weight, 14 of which had been surgically castrated, exhibited the following findings in response to a cholesterol-supplemented diet (0.5 gm. of cholesterol in 5 cc. of olive oil daily) fed for 50 days: similar patterns of feed intake and weight gain, more marked hypercholesterolemia in the group of animals whose ovaries had been removed, and more marked aortic and coronary atherogenesis in the intact animals. On microscopic examination, all the hearts but one were found to have coronary lesions. In accord with the aortic findings, the group with ovariectomy had significantly lower grades of coronary lesions. In most animals of both groups, lesions consisted of subendo-

thelial lipid infiltration. Only two animals in the unoperated group and one in the operated group showed atherosclerotic plaques impinging on the lumen of the artery. Thus it appears that endogenous ovarian secretion in the rabbit has no suppressing influence on cholesterol-induced atherogenesis. Studies by other workers indicate that the same is true of exogenous estrogens. These negative results in the rabbit are in significant contrast with findings in the chick, in which both exogenous and endogenous estrogens are remarkably effective both prophylactically and therapeutically in inhibiting cholesterol-induced coronary atherosclerosis. Further work is necessary to ascertain the basis for this marked species difference. It may be related to the different plasma lipid response of the two species to estrogen, since cholesterol-fed chicks treated with the hormone show a marked enhancement of phospholipemia with depression of the plasma cholesterol-phospholipid ratio toward normal limits, while this response is minimal or absent in rabbits. In view of this species difference, clinical investigation is essential to determine the effects of estrogens on atherogenesis in man.

Fatal Fulminant Acute Carbon Tetrachloride Poisoning. R. B. Jennings. A. M. A. Arch. Path. **59:**269-284 (March) 1955 [Chicago].

Jennings presents eight cases of fatal carbon tetrachloride poisoning, which, on the basis of clinical and pathological findings, are divided into three groups: a renal failure group, an anesthetic group, and a fulminant group. Most patients who die of, or develop symptoms of, carbon tetrachloride poisoning fall into the renal failure group. Three of the patients here presented fall into this group. Varying degrees of anuria or oliguria and jaundice are commonly present. Signs of pulmonary edema and congestive heart failure appear sometime after the 4th or 5th day, and the patient usually dies around the 5th to the 12th day. Patients belonging to the anesthetic group, as did one in the present series, usually die while being exposed to a high concentration of the drug, usually by inhalation. These patients usually die before observable pathological changes develop. The author puts special emphasis on the four patients belonging to the fulminant group, in which clinical course is rapid; death results in 96 hours or less. Such cases are unusual, as shown by the fact that only 3 of the 75 cases of carbon tetrachloride poisoning on file at the Armed Forces Institute of Pathology fall into this category. These patients all had a uniformly stormy clinical course, characterized by disorientation, often with coma, prolonged nausea and vomiting, and shock. At postmortem examination only two organs were visibly involved, the liver and the kidney. The liver was the seat of fat infiltration and massive central, midzonal, and partially periportal necrosis, and the kidney contained a striking amount of fat in a basal position in the renal tubules, a lesion that Allen calls fat nephrosis. The most remarkable finding in these patients is the extensive, almost complete destruction of the liver, and it is probable that they died in acute hepatic failure.

Hürthle-Cell Tumors of the Thyroid. L. W. Gardner. A. M. A. Arch. Path. **59:**372-381 (March) 1955 [Chicago].

Hürthle cell tumors of the thyroid remain a controversial subject. There is no unanimity in nomenclature and classification. Many different terms have been applied to the 194 Hürthle cell tumors that have been reported in the world medical literature since 1907, when they were first described by Langhans. The author lists the theories of origin of Hürthle cell tumors and reviews 46 cases. Forty-two of the cases involved women, whose ages ranged from 16 to 72 years, and the ages of the four men ranged from 26 to 55 years. A palpable, painless mass in the neck was observed in 37 of the patients and a gradual increase in the size of the neck in 4 patients. Thirty-eight of the Hürthle cell tumors were solitary, spheroid, or ovoid, well-circumscribed and encapsulated new growths, which were easily enucleated. The smallest tumor measured 1.5 by 1.0 by 1.0 cm.; the largest mass measured 12.0 by 10.0 by 9.0 cm. The latter weighed 374 gm. The average weight was 71 gm. The cut surfaces were light tan, gray-yellow, yellow-pink, or yellow-gray in color and moderately firm in consistency. In five cases, a cyst-adenomatous structure was observed. In three cases, two separate encapsulated nodules were found in the same lobe. The characteristic cells of these tumors were polyhedral elements measuring 15μ to 25μ in diameter. The cytoplasm was abundant, densely eosinophilic, opaque, and finely granular; occasionally, it was foamy and vacuolated. Usually the cytoplasmic membranes were distinct. The nuclei, often eccentrically placed, were vesicular, and the chromatin was irregularly distributed. A minimal-moderate degree of anisocytosis, anisokaryosis, and hyperchromasia was noted. In a few instances, nuclear pyknosis was conspicuous. In 45 cases the histological features were uniform, without evidence of significant anaplasia, or vascular or capsular invasion, and a diagnosis of Hürthle cell adenoma was made. In one instance, anaplasia and capsular invasion necessitated a diagnosis of Hürthle cell carcinoma. Treatment consisted of lobectomy or subtotal thyroidectomy. The benign nature of these tumors is borne out by the follow-up study, which showed that 45 patients are living and well, without recognizable evidence of the disease. The term Hürthle cell tumor, with subcategories of Hürthle cell adenoma and Hürthle cell carcinoma, should be retained. Only new growths composed wholly of cells with abundant acidophilic cytoplasm should be classified as Hürthle cell tumors. The treatment of choice is complete lobectomy in primary Hürthle cell tumors. If palpable cervical lymphadenopathy is present, total thyroidectomy with neck dissection is warranted. The author is of the opinion that Hürthle cell change is associated with decreased growth capacity and a favorable prognosis.

Experiences with the Cytologic Examination of Bronchial Swabbings in the Diagnosis of Cancer of the Lung: A Study of 602 Cases. L. J. McCormack, J. B. Hazard, D. B. Effler and others. J. Thoracic Surg. **29:**277-282 (March) 1955 [St. Louis].

Cells obtained by direct swabbing of the bronchial orifices at the time of a diagnostic bronchoscopy from 602 patients were studied at the Cleveland Clinic. Wet-stained suspensions of the bronchial swabbings were examined. The method is of no additional inconvenience to the patient and permits the pathologist to fix the preparation permanently for later or review examination. Two hundred patients were considered clinically as having primary carcinoma of the lung. The clinical diagnosis was histologically confirmed in 158 patients (79%), by either bronchial biopsy, surgical exploration, or lymph node biopsy. The cytological findings were positive for neoplasm in 93 (47%) of the 200 patients. Bronchial biopsy gave positive results in only 52 (26%). With a combination of bronchoscopic biopsy and cytological study in the manner described, two-thirds of the cases can be diagnosed positively, as evidenced by the authors' results in studying the 400 most recently examined patients. No false positive cytological findings were reported.

Bone Marrow Diagnosis of Tumors. E. Korinth. München. med. Wchnschr. **97:**289-292 (March 11) 1955 (In German) [Munich, Germany].

Sternal biopsies were made in a large number of patients with proved malignant tumors of various type and location, and tumor cells were found in the sternal marrow of most of these patients. The morphological appearance of these atypical cells corresponded with that reported by other workers. Sternal biopsies were made in many patients with doubtful complaints, in whom abnormal conditions were suggested by the results of other tests such as erythrocyte sedimentation rate and fractionated removal of gastric juice with a tube, or in whom despite certain suspicions, roentgenologic examination or endoscopy had given normal results. Sternal biopsies were also made in persons who previously had been subjected to presumably successful radical operations for neoplastic disease and in whom it seemed desirable to get information concerning a possible recurrence independently of the presence or absence of symptoms. In a significant number of all these patients the sternal biopsies showed atypical cells in the bone marrow, which in most cases were manifested by small cell groups or single scattered cells. Some of these patients in whom no other proof of a neoplastic disease was found were operated on, and in all of them tumors were found that occasionally had not yet invaded the regional lymph nodes, while others already were inoperable. The concept is proposed that the atypical cells in the sternal marrow are either disseminated tumor cells that had been caught and broken up

by the reticulohistiocyte system before a tendency toward the growth of atypical tissue develops in the local tissues, or that they originate from manifest, growing foci of tumor tissue. A positive result obtained by examination of the sternal marrow for the presence of tumor cells makes it possible to recognize a malignant disease before it is made manifest by the presence of metastases. Sternal biopsy, however, does not give any proof of the location of the primary tumor; occasionally suggestions may be possible concerning the epithelial or mesenchymal origin of the neoplasm. Not only tumors that metastasize in bones can be diagnosed by this method but also malignant tumors of all organs. Sternal biopsy when performed by an expert is not only an autonomous diagnostic method for neoplastic diseases but also may serve as an aid in the early diagnosis of tumors.

Histological Aspect of Liver in Alcoholism: Observations on Thirty-Two Cases Studied by Liver Biopsy. G. Manghini, N. Benda and F. Orlandi. Minerva med. **46**:61-66 (Jan. 13) 1955 (In Italian) [Turin, Italy].

Results are reported of histological studies made on biopsy liver specimens of 32 alcoholics in whom definite pathological signs ascribable to organic alterations were not observed. Neurological manifestations, often irreversible, were present in many. Patients with clinical signs of severe hepatic impairment were excluded. The patients were divided into two groups according to whether the biopsy was performed at the time or immediately after their admission to a neuropsychiatric clinic or at a later date. All the patients were addicted to wine only and had been heavy drinkers for from a minimum of 3 years to a maximum of 40. Most of them were poorly nourished. In five patients who had been institutionalized for some time before the biopsy was taken, histological examination did not reveal significant pathological alterations despite the fact that an enlarged liver was present in all. Steatosis was found in many patients of the second group; it was marked in 16 and mild in 3. In the other eight patients of this group the findings were almost normal. The steatosis did not present a uniform morphological aspect; in the cases in which it was mild, there were small drops of fat in the cytoplasm, and the volume and position of the cytoplasm and the nucleus were not altered significantly. In the more severe cases the fat occupied four-fifths of the cell's volume and the topographic nucleocytoplasmatic ratio was greatly altered. The steatosis was either localized or diffuse. When it was mild, it was located in the perilobular area, namely, the area into which the alcohol-laden portal blood flows. Steatosis was the only lesion found in these patients. In none of them were signs of active cirrhosis or changes of a precirrhotic type observed.

RADIOLOGY

Scatter Doses Received on the Lower Extremities of the Diagnostic Radiologist. G. Spiegler and B. E. Keane. Brit. J. Radiol. **28**:140-146 (March) 1955 [London, England].

In the course of investigations on protection in diagnostic departments it has become obvious that the radiologist often receives scatter doses to his legs that are in excess of the basic permissible weekly dose and considerably larger than those evaluated from the conventional monitoring film-badges worn in the breast pocket. The doses to the legs are chiefly produced during undercouch work by back-scatter from the surface of the patient. In undercouch work protection is far more readily achieved against side-scatter than against back-scatter as the lead apron commonly worn by the radiologist is effective against side-scatter. Additional protection is provided by moving the beam inside the patient, whereby a layer of the patient's tissue is interposed between the beam and the fluoroscopist. It should also be borne in mind that as the applications of radiological methods become more numerous, the exposure of the staff of diagnostic departments to scatter is bound to increase. In order to clarify the origin and distribution of back-scatter from patients undergoing fluoroscopic examination Spiegler and Keane continued their previous work on scatter with diagnostic beams. They discuss the distribution of scatter about a phantom. They investigated the dependence of back-scatter on size of beam, length of cone, and kilovoltage. Some suggestions are made to improve protection.

Treatment of Pulmonary Carcinoma with Large Doses of Roentgen Rays Through a Lead and Rubber Grid. R. L. Baart de la Faille and D. S. Bartstra. Nederl. tijdschr. geneesk. **99**:560-566 (Feb. 19) 1955 (In Dutch) [Haarlem, Netherlands].

Baart de la Faille and Bartstra cite figures that demonstrate that the prognosis of lung cancer with surgical treatment is unfavorable. A report by Marks in 1952, on a grid method of roentgen irradiation for cancer of the lung, which was first suggested by Köhler in 1912, induced Baart de la Faille and Bartstra to try the Köhler-Marks method, in which 30,000 roentgens are applied to the lung through a lead-rubber grid. This large total dose is applied through two fields, one on the front and one on the back, 750 r being applied to each field at one session. The effect of the grid on the distribution of the applied dose is discussed. A statistical analysis of the 40 cases in which the authors used this method is not as yet possible, since a period of two years or less is too short for such an evaluation. Their impressions so far are favorable, particularly as regards the subjective reaction of the patients. Very few complications were observed and resections carried out after treatment revealed necrosis of the cancerous tissues, whereas the normal interstitial tissues appeared to be undamaged. In some cases this form of x-ray therapy can be combined with resection.

PHYSIOLOGY

"Direct Cerebral Hypothermia" as Means for Artificial Hibernation. M. De Gregori, R. De Martini, C. Saccon and others. Minerva chir. **9**:1150-1153 (Dec. 31) 1954 (In Italian) [Turin, Italy].

The authors report the results of their experiments with "direct cerebral hypothermia" in 16 dogs. They state that it is easy to carry out and that it is followed by a progressive slowing of the breathing and cardiac activities and by a parallel drop in body temperature. This drop is directly proportional to the duration and degree of cerebral cooling induced. After the cerebral hypothermia is interrupted there remains a slight "secondary hypothermia." Complete resuscitation is secured in from 24 to 32 hours, and, in the resuscitation process, the resumption of the vegetative functions follows closely the cerebral temperature. The experiments were performed at a room temperature of 17 to 20 C on dogs that had been kept fasting for 18 hours. An electrocardiograph, a pneumograph, and an oscillograph were connected to the animals, whose neck had been shaved. The left femoral vein was prepared with local anesthesia using a 1% procaine solution; a 5% glucose solution was injected at the rate of 5 drops per minute; and the first electrographic findings were recorded. Anesthesia was induced with pentothal (10 mg. per kilogram of body weight); intrathecal intubation and closed circuit respiration were instituted; and administration of oxygen was begun. Needle electrodes were applied subcutaneously to record the electroencephalographic findings. The rectal temperature was checked constantly, and all electrographic findings were recorded in relation to the fall in temperature. An ice skullcap and a collar band were applied. After the cooling was begun, it was still necessary to administer pentothal until the average dose of 20 mg. per kilogram of body weight was reached. Then 5 mg. of chlorophenothiazine per kilogram of body weight was given in divided doses and the soda lime was removed from the closed circuit. The cerebral cooling was prolonged for varying lengths of time, and thus varying degrees of rectal temperature, heart rates (to 60 per minute), and breathing rates (8 to 12 per minute) were obtained. To restore the dogs to normal a heat-producing skullcap and a collar band were applied. Resuscitation was delayed in some dogs to test whether a "secondary hypothermia" resulted. The animals tolerated the experiment well, and no sequelae were observed in follow-up six months later.

BOOK REVIEWS

Text-Book of Orthopedic Medicine. Volume I: Diagnosis of Soft Tissue Lesions. By James Cyriax, M.D., B.Ch., Physician to Department of Physical Medicine, St. Thomas's Hospital, London. Cloth. $12.50. Pp. 692, with 128 illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16, 1954.

This book is difficult to review because so many different concepts of soft tissue disabilities are presented. The author has been known for many years as a manipulator, stressing the fact that manipulation and massage should be used a great deal more than they have been, so much so that at times he seems to use manipulation and massage as the only modality. It is very interesting to note that one who has been a manipulator and then, with the advent of physical medicine, has become a consultant in physical medicine now proposes that he, and others like him, be known as orthopedic physicians in contrast to orthopedic surgeons. To point out each and every place where the conclusions of the author are questionable would take up too much space. One of the points that the author brings out emphatically is the idea of pathological entities and his opinion of such things as fibrositis and myositis. He goes into great detail to explain why such lesions, to him, cannot exist. It would be interesting to have an opinion from others in this field regarding some of these debatable statements. The details of nerve distribution are presented well, and this portion of the book is a good reference guide, particularly for referred pain.

A large part of the book is spent on the pain syndrome that may have its origin in the cervical spine. According to the author, practically every pain in the neck and upper extremities can be explained on the basis of a cervical disk lesion. The manipulative treatment again may be a matter of controversy, especially the statement "laminectomy is hardly ever required for protrusion at any cervical level." At least in the United States operations for the relief of cervical disk pain are increasing rather than decreasing. A similar view that any pain below the level of the iliac crests can be explained on the basis of a lumbar disk disruption is expressed, and again the method of treatment is by extreme manipulation, even to a pull of 200 lb. The details of these manipulative procedures, however, are sketched only briefly in this book, and readers are referred to volume 2, which was not available for review at this time. The author's comment on arthrodesis of the spine again calls for much further discussion, and one would obtain the impression that a spinal fusion is a simple procedure or, as the author states, "a minor operation," but again the author gives a dire outlook about the length of time the patient must be incapacitated following such a procedure. This viewpoint is open to question. A further example of variations of opinion is that the author stresses that a patient with a lumbar disk involvement should hold the back in hyperextension, whereas most orthopedic surgeons, as well as neurosurgeons, in this country believe that the spine should be kept in flexion. If one reads this book as an interesting viewpoint of a physician whose chief therapy lies in manipulation and/or massage, it makes interesting reading. There is too much controversial material, and emphasis on the author's opinion alone, to warrant this book's being given as reading matter for students or house staffs. If the author is correct in all of his deductions, then most orthopedists are so far behind times that a great deal more work must be done and reported to make all the tenets in this book feasible.

The Human Machine: Biological Science for the Armed Services. By Charles W. Shilling, Captain, Medical Corps, United States Navy. Cloth. $5. Pp. 292, with 156 illustrations. U. S. Naval Institute, Annapolis, Md., 1955.

This volume consists of three parts. The first part on the construction and operation of the human machine parallels the anatomy and physiology found in textbooks for freshman courses in college hygiene. Part two, on preventive maintenance and repair of the human machine, is comparable to the college course on personal and community health. Part three, entitled "The Human Machine as Part of the War Machine," goes far beyond the usual courses in human biology and involves the protection of the human machine from the impact of environment in most of the types of environment that will be encountered in modern naval warfare. This book is unusually interesting, because wherever possible the explanation is made in engineering terminology, with illustrations drawn from the general knowledge of the engineer. Designed for freshmen at Annapolis, this volume would be equally useful in any engineering school that wishes to provide a course in human biology and personal and community health that carries an engineering flavor. It would also be an excellent reference book for anyone teaching health and human biology because of the richness of its illustration and the unusual approach it takes to problems in the health field.

Omphalosophy: An Inquiry Into the Inner (and Outer) Significance of the Belly Button. By William Bennett Bean, M.D. Paper. 50 cents. Pp. 20, with 7 illustrations. The author, Univ. Hosps., Iowa City, Iowa, [1953].

This book is thin and unassuming. The verse within is no whit worse than some the book clubs are consuming. Its major fault is being terse. Perhaps the navel's over-long for casual after dinner song, or anatomical display, but the art that's shown in others makes Bean, Nash, Holmes, and Pindar brothers in prosodical array. Those satirized, on Boards and such, may leaf it through with pain. At fifty cents you can't lose much, and will have more to gain.

Fluid Therapy. By James D. Hardy, M.S., M.D., F.A.C.S., Associate Professor of Surgery and Director of Surgical Laboratories, Medical College of University of Tennessee, Memphis. Cloth. $5.50. Pp. 255, with 77 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1954.

Of the many books that have appeared in recent years on the general subject of fluid therapy, this is probably the best. Although the author's purpose in writing this volume is "to present a concise discussion of total fluid therapy," the material covered is much wider than this, inasmuch as there are excellent chapters on blood loss, common surgical problems such as intestinal obstruction, and a sound discussion of the general physiology of water and electrolyte metabolism. Of special value are the many case reports culled from the author's own experience and presented simply and directly. The basic physiological mechanisms underlying therapy are clearly explained. Written by a clinician, the book will undoubtedly be understood by most clinicians. In addition to the case reports, there are many experimental data, based largely on the author's observations, many of them not hitherto published.

While a number of adverse criticisms may be made, they do not detract from the general excellence of the text. The bibliography at the end of each chapter is often sketchy and incomplete, and the author has not always selected the most important or informative contributions in each field. The discussion of osmotic pressure of body fluids is a little confusing, in that the oncotic or colloidal effect of plasma proteins is not clearly set forth. One might question the value of reproducing photographs of heavy water equipment, colorimeters, flame spectrophotometers, Van Slyke's apparatus, and the Geiger counter. On the other hand, the illustrations and discussions of the methods of venipuncture are valuable and informative. On page 28 the term "normal solution" is used synonymously with "molar solution," which in terms of sodium chloride would mean one containing 5.8% of this salt. While this might be correct theoretically, it should have been so explained, inasmuch as the word "normal" is commonly applied to isotonic solutions of sodium chloride that contain but 0.85 to 0.9% of sodium chloride. In the first burn case described, the patient sustained a weight gain of nearly 10 kg. (22 lb.) during the first three days of therapy. Such a large retention of fluid would be justified if it were necessary

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

to give that much to maintain the integrity of the peripheral circulation impaired by critical losses into the burned area. That this was true in this case is not clearly indicated. However, the statement that generalized edema was observed points to overhydration. Since at the present time excessive amounts of parenterally given fluids are so commonly administered, it needs to be emphasized that more harm than good often follows such overzealous therapy.

In general, this book can be highly recommended to students, residents, and practitioners as a source of authentic basic knowledge as well as of sound practical information in the treatment of a great variety of patients suffering various water, electrolyte, and even nutritional disturbances.

Flight Surgeon's Manual. AF Manual 160-5. Cloth. Pp. 712, with illustrations. Department of Air Force, Washington 25, D. C., 1954.

This comprehensive manual is designed to assist the Air Force flight surgeon in his professional and administrative duties. The section on aircrew effectiveness is the largest and takes up the various stresses on the normal human body brought about by combat flying. This is the section that would interest most physicians, as it discusses such subjects as decompression sickness, motion sickness, effects of flying on hearing, problems of the bailout, fear of flying, effects of temperature changes, noxious gases, injuries in aircraft accidents, and many related subjects. This is followed by a section on preventive medicine; atomic, biological, chemical, and psychological warfare; medical research and development; and air transport of the sick and wounded. The remainder of the book (about one-quarter) is devoted to purely administrative matters. The text is profusely illustrated, and lists of references are given when indicated. It is bound in a flexible loose-leaf binder and has an index. It could have been improved by providing legends for a few of the charts and figures from which they have been omitted.

Physiology of Flight. A. F. Manual 160-30. Cloth. Pp. 196, with illustrations. Department of Air Force, Washington 25, D. C., 1955.

This manual is primarily directed to the flight surgeon and other personnel concerned with the physiological stresses to which the flyer in the Air Force is subjected. There is a certain amount of overlapping of the material presented in this and the "Flight Surgeon's Manual." The problems of exposure to decreased amounts of atmospheric oxygen, rapid ascent, survival at high altitudes, climatic influences, effects of flying on vision, effects of noise, effects of prolonged acceleration and abrupt deceleration, escape from disabled aircraft, exposure to noxious gases and vapors, nutrition during flight, and other subjects are discussed. At the end of the volume there is a bibliography, a group of tables, and an index. The text is well illustrated and accomplishes its limited purpose in an excellent manner. It comes in a flexible loose-leaf binder.

Clinical Diagnosis. By Elmer G. Wakefield, B.S.A., B.Sc., M.D., Consulting Physician, Section of Medicine, Mayo Clinic, Rochester, Minn. Cloth. $22.50. Pp. 1611, with 135 illustrations. Appleton-Century-Crofts, Inc., 35 W. 32nd St., New York 1, 1955.

In this day, when many textbooks are compilations by many authors under one or more editors, it is refreshing to find an author who is willing to encompass so broad a field as clinical diagnosis. It is inevitable under such circumstances that the balance of the book is somewhat distorted. The book is also somewhat strangely organized, and this leads to a certain amount of repetition. For example, on pages 674, 675, 676, and 685 there are references to the fact that atherosclerosis or arteriosclerosis occurs prematurely in diabetic patients. There are a few inaccuracies; the statement is made that "in partial heart block the rate is slow, 50 to 40 per minute or less." There are a few omissions; no mention is made of the importance of assessing the relative amount of insufficiency and stenosis of the mitral valve now that surgery is available. The English style is pleasant, and the book is enlivened and enriched with an occasional bit of dry humor or philosophy. It has a good index that compensates materially for its peculiar organization. It has an extensive bibliography. It represents a monumental amount of work for one author and should prove useful to medical students, interns, residents, and general practitioners.

Textbook of Bacteriology. By Joseph M. Dougherty, A.B., M.A., Ph.D., and Anthony J. Lamberti, B.S., M.S., Instructor in Bacteriology and Parasitology, Temple University School of Medicine, Philadelphia. Third edition. Cloth. $8.25. Pp. 598, with 190 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1954.

The authors are teachers of premedical and predental students and students preparing to teach biological sciences. It is written to interest the large numbers of undergraduate students required to study bacteriology. The book is not a reference book. In this edition the footnotes have been removed, and a few references are listed at the end of the chapters. The section on chemotherapy in the discussion of the various infections has been eliminated. New chapters have been added that deal with the following subjects: growth and death of bacteria; bacteriology of air and soil; normal bacterial flora of the body; the Lactobacillus and Listeria groups; and miscellaneous bacteria. Four new chapters are included to replace the original chapter on the colon-typhoid-dysentery group. The chapters concerned with classification, morphology, chemistry and metabolism of bacteria, immunology, and the viruses have been rewritten. The format and type are excellent, and the illustrations are good. Oversimplification of the material may mislead the student who subsequently takes advanced work and learns that the subject matter is highly controversial. The book is not recommended for the medical profession.

A Handbook of Operative Surgery: Surgery of the Small and Large Intestine. By Charles W. Mayo, M.D. Cloth. $9. Pp. 340, with 94 plates by Russell Drake. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1955.

The author's statement that surgical judgment is more important than surgical technique should be emphasized again and again. It is particularly helpful when, as in this book, an author and an illustrator so skillfully synchronize their efforts. The illustrations have been done with a crispness that only a master in the art of line drawing could accomplish. The text is free from verbosity. The procedures described are those that have been successful in the hands of the author. The book can be recommended.

Modern Diagnosis and Treatment of the Minor Venereal Diseases: The Management of Chancroid, Granuloma Inguinale and Lymphogranuloma Venereum in General Practice. By Orlando Canizares, M.D., F.A.C.P., Associate Professor, Clinical Dermatology and Syphilology, New York University, Post-Graduate Medical School, New York City. Publication number 223, American Lecture Series, monograph in American Lectures in Dermatology. Edited by Arthur C. Curtis, M.D., Chairman, Department of Dermatology and Syphilology, University of Michigan, Ann Arbor. Cloth. $3.75. Pp. 131, with 19 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, Canada, 1954.

One might argue about the usefulness of classifying syphilis and gonorrhea as major, and chancroid, granuloma inguinale, and venereal lymphogranuloma as minor venereal diseases. The three latter diseases are not minor insofar as incidence, severity, and tractability are concerned. The author himself states that in white American soldiers in Korea, for instance, chancroid was 14 times more common than syphilis. Moreover, there is much doubt as to whether granuloma inguinale should even be classified as a venereal disease, for, as the author has noted, it does not appear to be very contagious, since the marital partner seldom becomes infected. Apart from these purely semantic difficulties, it should be stated that this short book is a perfect example of clear and concise medical writing. Its economy, together with its full treatment of the subject, is particularly impressive; the symptoms, diagnoses, and treatment of the three diseases are presented clearly and briefly. The text is reinforced by tabulation of diagnostic tests (their availability and their value and limitations) and therapeutic measures (with the advantages and disadvantages of each type of medication, dosage, and minimum effective dose). Differential diagnosis is well covered and also summarized in tabular form. Such clarity, brevity, and conciseness could be achieved only by a man with vast experience in the field. In his foreword, Dr. Combes emphasizes that the great progress in the field is well illustrated by the brevity of the booklet, replacing most satisfactorily the ponderous volumes of the past. Indeed, only 20 years ago, among the

hundreds of treatment methods recommended for chancroid, only the local application of iodoform was moderately effective, while venereal lymphogranuloma and granuloma inguinale were practically intractable. Today, most gratifying results are obtained in all three diseases with sulfonamides and antibiotics respectively. The book is highly recommended to general practitioners, surgeons, internists, and dermatologists.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Die Bronchographie. Von Dr. Ernst Stutz, Dozent an der Universität Freiburg i. Br., und Dr. Heinz Vieten, Dozent an der medizinischen Akademie Düsseldorf. Ergänzungsband 72, Fortschritte auf dem Gebiete der Röntgenstrahlen vereinigt mit Röntgenpraxis, herausgegeben von H. Holthusen und R. Glauner. Cloth. $15.70; 66 marks. Pp. 250, with 181 illustrations. Georg Thieme, Herdweg 63, (14a) Stuttgart O, Germany; agents in U. S. A. and Canada, Intercontinental Medical Book Corporation, New York 16, 1955.

Books on bronchography are available in other languages, but in German there are only a few monographs, outdated and relating to iodized oils. New contrast mediums used in Germany and other countries, as well as extensive use of bronchial fillings, have brought out new problems. The development of thoracic surgery has raised new diagnostic questions. Individual single publications are numerous and are spread throughout international literature, but many are not available in radiological periodicals or are difficult to locate. All these factors led to the writing of this book on modern bronchography and problems of bronchographic technique. This volume is primarily for the practicing roentgenologist as an aid to bronchographic diagnosis. For a better understanding of individual disease, the roentgenographic findings concerning symptoms and lesions are briefly considered. Many references are cited, but it would have been impossible for the authors to include them all. The physician conversant in German should enjoy this well-prepared, excellently illustrated book and should especially enjoy comparing it with English works on this subject.

Medical Students and Medical Sciences: Some Problems of Education in Britain and the United States. By D. C. Sinclair, M.A., M.D., University Demonstrator in Human Anatomy, Oxford University, Oxford. Oxford medical publications. Cloth. $5.75; 25s. Pp. 154. Oxford University Press, 114 Fifth Ave., New York 11; Amen House, Warwick Sq., London, E.C.4, England, 1955.

This delightful volume was written by the author after a three months' trip in 1953, during which period he visited 12 medical schools in the United States and one in Canada. He has endeavored to convey his impressions of some of the problems in medical education in America and compare them with current problems in this field in England. The volume is exceedingly well written, and its comments are based on the result of acute observations, keen insight, and thoughtful and objective comparison of students, teachers, and curriculums, as well as basic background problems.

The first of the four sections into which the volume is divided deals with the student. Deans and admission committees as well as students will find the part dealing with selection of medical students of great interest. After discussing the various factors used in selecting medical students and indicating their good and bad features, the author clearly implies that there is reason to question whether we do not need to further revise our ideas about many facets of this difficult responsibility. An effort is then made to describe the student who has gained admission and why he frequently does not materialize into the paragon admissions committees endeavor to select. In the second section, which deals with teaching, the author discusses the teaching staff, the teacher, the transference of information, stimulation of interest, assessment of students, and the examination paper. Deans will be interested in his conclusion that in American medical schools, at least, being a dean is a full-time job. His observations on the pressures produced by the system of project research and the overemphasis on research rather than teaching competence are timely and worthy of serious thought. The ideal teacher, in contrast to the ideal student, is described as a shadowy creature, but the author does clearly indicate what he believes teachers should be and what they should try to accomplish. Methods of transference of information and stimulation of interest deal with areas that continually plague the imaginations of good teachers. Problems of student assessment and examinations are discussed at some length, and their relative merits and limitations are indicated. The author's philosophy in regard to examinations is expressed by the comment: "The ideal examination paper, in fact, has still to be discovered, and in view of the influence such papers can exert on the student's attitude toward the subject, his method of learning, and perhaps his mental stability, it is surely time that more attention was turned to the form and functions of examinations. It might even be considered a reflection on the generality of medical schools that they so confidently determine a student's future by a weapon about which they are content to know so little."

The third section deals with the material taught and presents the preclinical or basic science curriculum, the first stage of form and functions, and the second stage of drugs and diseases. The ancillary subjects now being fitted into the curriculum, such as psychobiology, biostatistics, biophysics, genetics, medical history, and medical library utilization are commented on in perspective. The final section deals with trends and assessments of current educational experiments and pleads for long-range planning as well as long-range assessment of changes wrought in student's abilities by the application of various methods of teaching. The author admires the courage with which these innovators press into the unknown in their educational experimentation.

Although some medical educators will differ with the author's point of view, they should all find this volume thoughtful, stimulating, and provocative. It is a valuable addition to current writings in the field of medical education and deserving of a wide audience.

Manual of Medical Helminthology. By C. J. Hackett, M.D., F.R.C.P., with co-operation of Professor J. J. C. Buckley, D.Sc., and the late Professor F. Murgatroyd, M.D., F.R.C.P. Cloth. 18/6. Pp. 330, with illustrations. Cassell & Co., Ltd., 37-38 St. Andrew's Hill, London, E.C.4, England, 1954.

This manual based on the helminth exhibits of the Wellcome Museum of Medical Science, London, was prepared for physicians in the tropics. After a brief general statement concerning helminthic diseases, trematodes, cestodes, and nematodes are described as classes. After this, various species are described. Throughout the book the term "aetiology" is used as a main heading to cover the morphology, habitat, and physiological data concerning the helminths. Other main headings used are life cycle, epidemiology, pathology, clinical pathology (changes in blood, urine, and feces), clinical findings, diagnosis, treatment, prognosis, and prevention. The book is well illustrated with line drawings, and it has an index. This book has the disadvantage that all small manuals presented in outline form show, that is, most persons sufficiently interested in the subject will want a more detailed reference text.

A Textbook of Physiology. Edited by John F. Fulton, M.D., Sterling Professor of History of Medicine, Yale University School of Medicine, New Haven, Conn. With collaboration of Donald H. Barron et al. [Formerly Howell's Textbook of Physiology.] Seventeenth edition. Cloth. $13.50. Pp. 1275, with 600 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1955.

The preface to this new edition is by Fulton and is followed by a reprinting of the preface written for the first edition in 1905 by Howell. Howell's successive editions ultimately attained an admirable compactness and clarity. Editions subsequent to his death have been the work of many contributors, and the present edition boasts 30. It is gratifying to report that the book is nevertheless remarkably unified, and that its size has been kept within reasonable bounds. Recent developments have made it necessary to add a chapter on acetylcholine and the energy transformations in nerve cells. The chapters on metabolism and nutrition by Brobeck include particularly up-to-date information about basal metabolic rates and should help to bring about the long overdue elimination of the surface-area factor. The wealth of good diagrams, the bibliographies, and the index make this a commendable work.

V 1
195

QUERIES AND MINOR NOTES

NEGATIVE PHASE OF POLIOMYELITIS VACCINE

To the Editor:—*Is it possible that cases of poliomyelitis following vaccination may have been precipitated in carriers by a negative phase? We heard much of that some 40 years ago when bacterial vaccines were developed and widely tried in all sorts of infections. 1. Does the Salk vaccine induce a negative phase? If so, what is its duration? As I remember, bacterial vaccines had an initial negative phase lasting 24 to 48 hours. 2. If there is a negative phase of longer duration, would it not be better to postpone mass vaccinations until next winter?* *Bernhard A. Fedde, M.D., Brooklyn, N. Y.*

Answer.—1. There is inadequate information at present to know whether vaccination with inactivated poliomyelitis virus vaccine creates a negative phase. Certain experimental studies are supposed to have suggested this, but there is no precise information. If there is one it would be expected to be of brief duration since antibody can be observed to develop in four or five days. 2. There are many reasons why vaccination might better be done in the winter rather than in the poliomyelitis season.

POLIOMYELITIS VACCINE AND TONSILLECTOMY

To the Editor:—*Is it advisable to perform a tonsillectomy and adenoidectomy on children taking the Salk vaccine or who intend to take the vaccine for poliomyelitis?*

T. N. Humphrey, M.D., Selmer, Tenn.

Answer.—On the basis of available evidence that tonsillectomy may have a provocative effect on poliomyelitis, it would seem wiser that a child who is to have a tonsillectomy should be given the course of vaccine before the tonsillectomy is undertaken.

CHRONIC HEMICRANIA

To the Editor:—*I have heard of the treatment of chronic hemicrania of unknown origin by means of head traction. Please give an opinion on the value of this form of treatment.*

M.D., New York.

Answer.—This inquiry is based on the contention of some physicians that in some instances chronic hemicrania is caused by disorders of the intervertebral disks in the cervical spine. Certainly this opinion has never been substantiated, and any treatment of hemicrania that is directed toward the cervical spine must of necessity be on a trial and error basis. The likelihood of obtaining relief in any considerable number of cases is not great.

BRUCELLA ANTIGEN

To the Editor:—*Is there a standard brucella diagnostic antigen available; if so, who makes it? If such is not available, would you care to suggest one of the present antigens as being preferable?* *Connell H. Miller, M.D., Sligo, Pa.*

Answer.—The Committee on Brucellosis of the National Research Council has advocated a standardized Brucella antigen for diagnostic purposes in human brucellosis. This material is to be used in the diagnostic tube-dilution Brucella agglutination test. The committee also recommended a technique in carrying out the test. Brucella antigen, which meets the standard set up by the committee, is now available from Lederle Laboratories, Pearl River, N. Y.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

ANTICOAGULANT FOR SMALL BLOOD SAMPLES

To the Editor:—*Which anticoagulant for small blood samples effects the least alteration in the red blood cells and permits the most accurate determination of red blood cell count and hematocrit: evaporated oxalate, evaporated acid citrate dextrose solution, or concentrated heparin? What would be the appropriate concentration of the anticoagulant for a 5 ml. sample of blood?*

Francis Coughlin, M.D., Montreal, Canada.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—Evaporated oxalate (Heller, V. G., and Paul, H.: *J. Lab. & Clin. Med.* **19**:777, 1934) and dried heparin are each satisfactory. Since acid citrate dextrose solution is isotonic, after evaporation it probably would cause some cell shrinkage as solid potassium oxalate does but would not influence the count. Four milligrams of potassium oxalate plus 6 mg. of ammonium oxalate is used for 5 ml. of blood (1 drop of a solution of 8 gm. potassium oxalate and 12 gm. of ammonium oxalate monohydrate per 100 ml. of water dried in an oven at a temperature not above 110 C). The amount of heparin is usually 0.25 to 0.5 mg. for 5 ml. of blood (0.05 ml. or 1 drop of the isotonic solution for 5 ml. of blood). This may be allowed to evaporate before use without changing the volume of packed cells appreciably.

Answer.—None of the anticoagulants named is ideal for all of the purposes stated. The following anticoagulants are suggested: Sequestrene (disodium ethylenediaminetetraacetic acid), 5 mg. per 5 ml. blood, is satisfactory for all purposes named. Isotonic sodium oxalate solution, 1.1%, 1 ml. per 5 ml. blood, is satisfactory for hematocrit and red blood cell count (making allowance for dilution) and poor for morphology. Heparin (sodium salt), 1% solution in isotonic sodium chloride solution, 0.05 ml. (0.5 mg.) per 5 ml. blood, is satisfactory for hematocrit and red blood cell count; some preparations of heparin may affect morphology.

DISINFECTION OF THE SKIN

To the Editor:—*What is considered the best technique for preoperative skin preparation, particularly in regard to Zephiran versus Merthiolate?*

Julius W. Welborn Jr., M.D., Tryon, N. C.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—Although other germicidal agents have been proposed and used for skin disinfection from time to time, 2% tincture of iodine U. S. P. for a period of two to five minutes or more continues to be the most effective. It will destroy a larger percentage of the normal bacterial flora on the skin than either tincture of Merthiolate or tincture of Zephiran, which are often used with a false sense of security. Either 1:1,000 aqueous solution or tincture of Zephiran is neutralized by traces of soap that usually remain on the skin, effectively eliminating any germicidal activity that this quaternary ammonium compound might have. Hexachlorophene is not neutralized by soap, but its action is relatively slow. The time during which a germicidal compound is allowed to act and the degree of penetration are important for skin preparation. Penetration can be increased by the application of the germicidal agent with a gauze mop and a firm scrubbing action.

Answer.—Disinfection of the skin preoperatively can be accomplished with diverse degrees of success depending on the time available. For elective procedures, the patient is instructed to wash the operative site twice daily with a soap or detergent containing hexachlorophene. The latter is adsorbed on the des-

quamating epithelium and exerts continuing bacteriostatic action. Hence the bacteria do not invade the maturing cells. They are forced to the surface with the keratinizing cells to be exfoliated. The resident bacterial flora of the skin disappears in five to seven days. The brief application of a germicide accomplishes little more than destruction of the transient bacterial flora on the surface of the skin. More prolonged exposure and friction aid in carrying the germicides deeper into the skin. The addition of detergents also exposes bacteria to contact with the germicide. Penetration of most germicides is self-limiting because of the formation of barrier films deep in the cornified layer. Bacteria flourish beneath the film and can be released by trauma, dissolution of the film by solvents, or in the excretion of the skin glands. The most effective single shot germicides are based on the germicidal action of calcium hypochlorite, the quaternary ammonium compounds, 70% ethyl alcohol, 50% isopropyl alcohol, orthophenyl-phenol, and iodine, particularly in combination with a surface-active agent. The latter two are more effective where tubercle bacilli must be destroyed. The mercurial germicides form superficial films on the skin. Under conditions of use they are bacteriostatic rather than bactericidal.

To answer the specific question, aqueous solutions of Zephiran are more effective than Merthiolate. Alcoholic solutions of either reflect the bactericidal action of the solvent and make comparison difficult. The best technique is to suppress the bacterial flora whenever practicable. Under emergent conditions, a lather is developed on the operative site, using hexachlorophene-bearing soap or detergent. This is best done after the patient is anesthetized and positioned for surgery. The site is shaved with a heat-sterilized straight razor and the skin is disinfected by application of any of the agents mentioned. This technique assures the surgeon the safest skin. Shaving the skin in the surgery is important because the inevitable trauma inflicted by the razor is fresh. After a brief interval, the nicks become inflamed in the process of healing and the bacterial flora flourishes inordinately.

HYPOPHYSECTOMY

To the Editor:—*How authentic is the work on decrease of pituitary hormone by removal of pituitary tissue and where is this work being done? How much of the gland is removed in these terminal cases? How long do such people live?*

Virginia E. Lane, M.D., Blue Mountain, Miss.

Answer.—Surgical hypophysectomy induces all the clinical and laboratory changes typical of hypopituitarism (Shimkin, M. B., and others: *J. Clin. Endocrinol.* **12:**439 [April] 1952). Attempted total hypophysectomy is now being tried experimentally in two kinds of nonpituitary disorders: (1) advanced carcinoma of the breast or prostate when it no longer responds to surgical, x-ray, or hormonal treatment, and (2) severe diabetes mellitus with progressive, intractable nephrotic syndrome (Kimmelstiel-Wilson's disease). In carcinomas arising in tissues sensitive to sex-hormonal influences, the rationale is removal of the stimulus to formation of sex hormones. In diabetic nephrosis, the procedure is performed to reproduce the "Houssay phenomenon," or amelioration of pancreatic diabetes by the production of hypopituitarism. In the spontaneously occurring Houssay phenomenon, not only is diabetes mellitus greatly ameliorated, but some of its complications, such as retinopathy, may be reversed (Poulsen, J. E.: *Diabetes* **2:**7 [Jan.-Feb.] 1953). Surgical hypophysectomy for these conditions is currently being evaluated at the Sloan-Kettering Institute, New York City; the University of Chicago; the University of California Hospital, San Francisco; and the Serafimer Laseretet, Stockholm, Sweden. Results obtained in the various centers are difficult to compare because completeness of hypophysectomy differs with the different techniques used, and published reports are thus far fragmentary. The following conclusions seem warranted: 1. Surgically induced hypopituitarism is not incompatible with life, and in most cases the only substitution therapy required after postoperative stabilization is simple administration of thyroid substance. 2. Hypophysectomy induces remissions of some far-advanced carcinomas of the breast and prostate, and survivals of more than two years have been reported. Whether remissions are sufficiently frequent or long lasting to justify this procedure cannot yet be stated. 3. Hypophysectomy ameliorates severe diabetes mellitus and halts the progression of, or actually reverses, some of the complications, e. g., retinopathy and diabetic nephrosis (Luft, R., in Recent Progress in Hormone Research: Proceedings of Laurentian Hormone Conference, New York, Academic Press, Inc., 1954, vol. 10, p. 457). It is to be stressed that these indications for hypophysectomy are experimental, but the procedure, in skilled hands, is not particularly hazardous nor the end-results disturbing to the patient. At the 1954 meeting of the Endocrine Society, three groups of investigators reported that their patients in whom adrenalectomy and gonadectomy had previously been done considered hypophysectomy a much less severe procedure than either of the other operations. Finally, pituitary function cannot be measurably reduced by x-ray therapy in doses as large as 11,000 tissue roentgens (Kelly, K. H.: *J. Nat. Cancer Inst.* **11:**967 [April] 1951).

INFERTILITY

To the Editor:—*A 30-year-old man has been married five years; the couple is childless. The man had no history of any serious illnesses. As an attorney he works under tension and is high strung. He has psoriasis, which is aggravated by nervous or physical strain. He has chronically inflamed pharynx and tonsils. He smokes about 40 cigarettes a day, and a discontinuance of smoking, even for a short time, brings about marked improvement in his throat and mouth. Otherwise he appears to be a normal, well-developed, vigorous young man. Sperm count showed a volume of less than 1 cc., with a count of 30 million per cubic millimeter, of which less than 20% are active, motile forms. Would discontinuance of smoking and promotion of relaxation improve this patient's sperm count? Are there any specific endocrine measures of value in such a patient?* *M.D., Montana.*

Answer.—This type of patient is frequently encountered in urban populations. He has drifted into unhygienic living habits. Here they seem to have been caused by the sedentary nature of his occupation together with the nervous strain engendered by his calling. These elements doubtlessly have a deleterious effect on fertility. Relaxation should be sought, if at all possible, as it is of prime importance. Though smoking has not been proved beyond a reasonable doubt to be involved in sterility, some reports point to improvement when the use of tobacco is diminished or discontinued. Unfortunately endocrines have been disappointing in impaired fertility. In this form of subpar fertility, thyroid extract may be helpful in suitable cases. Some give it empirically and claim success. The best prospects, however, seem to be offered by a high vitamin and high protein diet with special emphasis on fish and sea food, by proper living habits, and by coital regulation along hygienic lines.

ANGIOSPASTIC DISEASE

To the Editor:—*In cases where whisky is recommended for patients with angiospastic disease, it is frequently stated that only brandy should be used for its vasodilating effect. It is implied that other whiskeys, such as rye or Scotch, are contraindicated because the ergot present in these grains may produce vasoconstriction. Is there any basis for this belief? What recommendations specifically should be made to a patient regarding this aspect of treatment?* *M.D., Massachusetts.*

Answer.—Experiments performed with isolated rabbit hearts by Vartianinen and associates (abstracted, *Quart J. Stud. Alcohol* **15:**499 [Sept.] 1954) indicate a slight vasodilating effect of alcohol, but brandy perfused directly into the hearts caused increased blood flow up to 80%. This effect was considered to be caused by the tannin and other extractives from the oak barrels in which the liquor had been stored. They conclude that the prescribing of brandy in vascular disease may be justified if there is a lack of better drugs. The risk, according to these authors, is that the elimination of pain may cause the patient to submit to undue strain. The central sedative effect may be beneficial in lessening anxiety. Alcohol should not be prescribed routinely because of the possibility of misuse. Russek and associates (*J. A. M. A.* **143:**355-357 [May 27] 1950) tested the electrocardiographic response to alcohol in five patients with angina pectoris. They concluded that alcohol cannot be accepted as a coronary vasodilator and that its effect is due to its sedative action upon the higher nervous centers, increasing the threshold of pain while

promoting a sense of well-being. These effects may prove hazardous if a patient is to undergo any kind of exertion. Ingestion of whisky may remove not only the protection afforded by angina but also the restrictions imposed by psychogenic influences. If angina is relieved or fails to occur, effort may be pressed and sudden death or fatal seizure may ensue. Since whisky is a distillate, there is no danger of ergot appearing in it, even if it were present in the mash. Alcohol in any form is not recommended in angiospastic disease.

CALCIUM AND PHOSPHORUS INTAKE DURING PREGNANCY

To the Editor:—*What is the effect of calcium and phosphorus intake during pregnancy? A recent paper appears to establish that dibasic calcium phosphate may induce leg cramps. Has this been confirmed by other investigators?*

John A. Olson, M.D., Cranford, N. J.

Answer.—Page and Page (*Obst. & Gynec.* **1**:94 [Jan.] 1953) said that it was apparent that when obstetric patients were urged to drink more milk or were given dicalcium phosphate leg cramps were induced, whereas substitution of calcium lactate or calcium gluconate relieved cramps. It was suggested that efficiency of intestinal absorption of phosphates might increase during gestation, with resultant depression of ionized calcium in the blood. To test the hypothesis that predisposition to muscle tetany during the latter half of pregnancy is due to disturbed electrolyte ratios (including reduced level of ionized calcium either because of more efficient absorption or because of diminished renal excretion of phosphorus), three forms of theoretically indicated therapy were tried. Of 120 obstetric patients with leg cramps, 36 who had been drinking over 3 pt. (1,470 cc.) of milk daily were treated by reducing milk intake to less than 1 pt. (473 cc.) daily; 40 who had been receiving dicalcium phosphate and vitamins were instead given 2 gm. calcium lactate and multivitamins; 44 were treated by moderate reduction in milk intake and 0.5 to 0.9 gm. aluminum hydroxide gel with each meal; and 21 received no treatment. All three methods of treatment, as against no treatment, yielded statistically significant results, those in patients with moderate reduction of milk intake plus aluminum hydroxide gel being the best. This work was corroborated by John Wolff (*Illinois M. J.* **105**:305 [June] 1954).

JOLLY TEST FOR MYASTHENIA GRAVIS

To the Editor:—*Concerning the Jolly test for myasthenia gravis: what is a positive reaction? What is a negative reaction? What diseases will give a false positive reaction? How reliable a test is it?* *M. Saperstein, M.D., Muncie, Ind.*

Answer.—The normal muscle responds to repeated faradic shocks over the motor nerve or the motor point by a brisk contraction. At rates of stimulation of two per second in the normal muscle no apparent fatigue or exhaustion occurs. At faster rates tetanic contraction appears. In the myasthenic reaction of Jolly, as seen in muscles affected by myasthenia gravis, the faradic excitability, when the same maneuver is repeated, becomes increasingly feeble and ultimately disappears. After a period of rest, the myasthenic muscle regains its normal responsiveness, but again, as the stimulation is continued, exhibits the myasthenic reaction as before. This response to faradic stimulation, with recovery on rest, is called a positive myasthenic reaction. A negative reaction is a normal response. If the Jolly test is correctly carried out, there are no false positive reactions. The test is reliable for myasthenia gravis provided the muscle selected for testing is known to be involved in that disease. As frequently many muscles are not affected, or only slightly affected at any one time, it is most important not to draw diagnostic conclusions from the examination by faradic stimulation of a nonaffected muscle, thus giving a "false negative" in a recognized example of the disease. The test may be considered entirely reliable if an appropriate muscle is used. It has, however, been largely replaced in recent years as a diagnostic test by the use of ergograms or electromyograms, taken before and after the injection of neostigmine or edrophonium chloride.

HYPERTENSION

To the Editor:—*A man in his 50's consulted a physician in July, 1954, because he was discharged from his work in an airplane factory because of high blood pressure, which was found to be 240/140 mm. Hg; his pulse rate was 90; and the heart normal to auscultation, though enlarged. He hardly had any subjective symptoms. Raudixin and phenobarbital did him no good. Therapy with four tablets of Rauwiloid and 25 mg. of apresoline daily was started, and the dose was increased gradually to 325 mg. His blood pressure went down in a few weeks to 170-180/110 mm. Hg. He was idle for three or four months, but was advised to find work where he would not have to concentrate intensely or hurry. He works now and feels all right. Since he has been given apresoline and rauwiloid for six months, how long would it be safe to continue the same treatment? It is intended to increase the apresoline dose to 350 mg. or higher. The patient's blood, urine, and nonprotein nitrogen are checked every six to eight weeks.* *George Kalichman, M.D., Santa Monica, Calif.*

Answer.—There is no reason for not continuing the administration of Apresoline indefinitely at levels of 300 to 500 mg. Reserpine or Raudixin therapy may also be continued, the most effective dose being determined for the individual patient. Later it may be desirable to include a strict low-salt diet or one of the ganglion-blocking agents. The problem in treating most hypertensive persons is to be sure the drug is doing the job. It should cause no surprise that the patient had no symptoms.

ANESTHESIA

To the Editor:—*In our city for anesthesia for abdominal operations on seriously ill patients many times a combination of sodium pentothal plus endotracheal intubation is used followed by an inhalation anesthetic plus anectine given intravenously. Is anectine a dangerous drug that is sometimes uncertain in its action? Is the anesthetic sequence that I have outlined as safe for such patients as endotracheally given nitrous oxide and oxygen and ether?* *M.D., Kentucky.*

Answer.—It is too soon to give a positive answer as to what the relative safety of anectine may be in comparison with ether for abdominal surgery in seriously ill patients. In their study, Beecher and Todd (A Study of the Deaths Associated with Anesthesia and Surgery, *Ann Surg.* **140**:2-34, 1954) found that the use of muscle relaxants greatly increased the over-all anesthesia death rate; however, anectine was not represented in that study with a sufficient number of cases to make a specific statement about it. In short, anectine is not yet sufficiently evaluated to answer the question raised with precision. To answer the second question: Like many other agents used in anesthesia the use of a given dose of anectine is followed by a somewhat variable response. Only time and further experience can determine whether this variability of action is sufficiently great to cause an unwarranted degree of serious complication.

MINERAL OIL AND LIPID PNEUMONIA

To the Editor:—*Is there a recognized pathology of mineral oil getting into the lungs after its use to loosen the bowels? What are the symptoms, treatment, and prognosis?*

Irving McNeil, M.D., El Paso, Texas.

Answer.—Lipid pneumonia due to either the prolonged and habitual use of mineral oil or oily nasal drops is a definite clinical entity. The reaction produced in the lung may appear on roentgenographic examination as a diffuse lesion or may be represented as a single well-circumscribed granulomatous nodule. The latter form is almost always confused with primary bronchogenic carcinoma. Oily nose drops are usually administered with the patient in the supine position, often before going to bed; mineral oil is often taken before retiring. The pharynx becomes coated by the light, soothing material, and small droplets of oil spill over into the trachea. The site of predilection of the pneumonic process is the posterior portion of the lower lobes. Symptoms, particularly in the nodular form, are uncommon. Dyspnea without an increase in respiratory rate has been reported. Excessive sputum and hemoptysis are uncommon. The

treatment is to stop the use of the offending agent. Prognosis is generally good, depending on the extent of pulmonary involvement. Practically all of the mineral oil is removed by expectoration; little is carried away by lipophages. Histological examination reveals pools of mineral oil surrounded by epithelioid cells and giant multinucleated macrophages and varying degrees of fibrosis. Examination of sputum stained with Sudan III may be of diagnostic help, particularly in the diffuse granulomatous type. Routine inquiry into the habitual use of various mineral oils by patients with abnormal roentgen shadows will help to solve many hitherto undiagnosed chest problems.

PAROXYSMAL TACHYCARDIA

To the Editor:—*A 72-year-old woman has frequent, severe bouts of paroxysmal tachycardia lasting two to six hours or longer unless treated with Cedilanid given intravenously, which controls an attack in 30 minutes. These attacks occur once or twice a month at any time of day or night but mostly in the early evening. Interspersed between severe boutes are frequent mild spells lasting one-half to two hours and controlled by quinidine sulphate, 3 grains (0.2 gm.) every four hours. These attacks have been present for three to four years in their present state and were milder previous to that. Physical examination and history are essentially normal. The blood pressure is 140/90 mm. Hg, pulse rate 72, and the electrocardiogram is within normal limits. The patient does not smoke or use alcohol. I have recommended digitalis, but the patient says it makes her feel "queer around the heart." Is there any treatment to prevent further bouts of paroxysmal tachycardia?*

William F. Luckett, M.D., Washington, D. C.

Answer.—It would be advisable to record one of the described attacks in the electrocardiogram to establish the nature of the paroxysmal tachycardia, whether supraventricular or ventricular, and to determine whether or not it is due to bouts of auricular fibrillation or flutter. The latter two possibilities appear to be likely in view of the age of the patient, the onset of attack in later life, and the prompt abolition of the bouts by intravenously given digitalis therapy. The most promising way to prevent the attack, which apparently has not been tried, is the continuous prophylactic use of orally given quinidine or Pronestyl. The dosage required in each particular patient cannot be anticipated and has to be established in the therapeutic trial. Quinidine sulphate, 3 grains (0.2 gm.), or Pronestyl, 250 mg. four times a day, would appear an adequate starting dose, perhaps to be reduced to three or two times a day in the case of a favorable response. If insufficient to suppress the attacks, the single dose of either quinidine or Pronestyl could be doubled and tried according to the same schedule.

INJURY TO ONE EYE

To the Editor:—*A 4-year-old girl was struck in left eye giving her a complete hemorrhage of the anterior chamber. After 10 days she was referred with an acute glaucoma, and, after a basal iridectomy with removal of all blood from the anterior chamber, the vitreous chamber is entirely dark and filled with clot. What is the suggested treatment?* *M.D., California.*

Answer.—Recovery of vision is possible and depends on several factors, none of which may be taken fully into account for several weeks. Treatment at present must be symptomatic and probably is not necessary. Permanent clouding of the cornea may already have occurred from blood staining. If not there is no further danger from that source. If the aqueous and the lens are clear there is no further danger of synechia, but the pupil should be dilated to allay the tendency to iritis and adhesions. If the intraocular tension is normal the use of atropine solution, 1% two times daily, is not contraindicated. There is no certain means of hastening the absorption of laked blood from the vitreous. Fever therapy and antibiotics that might be useful in treatment of an adult for this condition are not without hazard in case of a child. A snug-fitting pad should be worn over the eye, and the child's activities should be restricted to avoid recurrent hemorrhages. Transplantation of vitreous at this time is out of the question.

DIURETICS AND WEIGHT REDUCTION

To the Editor:—*A woman is over 50 years old, 5 ft. tall (150 cm.), and weighs 208 lb. (94 kg.). One of her friends told her that some of the doctors use injections for reducing. I immediately realized that she was informed about dehydration with mercurial solution. I have not used this method of treatment except in congestive heart failure with edema. This patient is plainly obese, and I would like to know if dehydration is used for obesity.* *J. T. LaHam, M.D., Ripon, Wis.*

Answer.—The use of any mercurial diuretic, or any other diuretic medication, in a case of plain obesity has no justification. Actually the decrease of weight from fluid loss in a nonedematous person is insignificant compared to that in heart failure, ascites (for which the mercurials were first used), or other conditions associated with water retention. Whatever diuresis results is immediately counterbalanced by retention of ingested fluids in order to restore normal balance, as in the case of strenuous exertion during which an athlete may lose 4 to 6 lb. only to regain this weight loss at once when fluids are taken. In fact the procedure is comparable to wringing a sponge dry and then tossing it into a bucket of water. On the other hand it must be remembered that water balance, and consequently weight, depend to a great extent on electrolyte balance, notably that of sodium, so that water goes where sodium goes and a degree of weight loss by dehydration can result from rigid restriction of sodium in all forms. In the rice diet as outlined by Kempner, containing 350 mg. of sodium chloride per day, it is not unusual to observe in a heavy patient a loss of a pound per day for 30 days, even though the diet provides practically caloric equilibrium.

Aside from the failure to produce the desired results, use of a mercurial diuretic in moderate or discreet amounts in the absence of edema is unlikely to result in unfavorable side-effects. The fact that all injections for reducing purposes are not mercurial diuretics should be kept in mind. Many of them contain multiple ingredients such as thyroxin, other thyroid preparations, vitamins, hormones of dubious nature, and possibly benzedrine or dexedrine derivatives.

ASTHMA

To the Editor:—*A housewife 55 years of age has had asthma for seven years. She has extensive food and inhalant sensitivity, which when treated by food elimination and diet rotation methods, along with hypodermic antigen administration, has not yielded to treatment. Three intravenously given arsenic (Mapharsen) treatments at weekly intervals apparently resulted in marked relief from asthmatic attacks. However, in giving the fourth treatment there was such immediate response in shock-like reaction and emotional upset that further treatments were abandoned. Local pain and swelling at the site of injection was not thought to be due to vein infiltration. Mapharsen was injected quickly as direction requires. Now the asthmatic attacks are intractable and with difficulty relieved by five to six adrenal injections at times.*

M.D., Kansas.

Answer.—The diagnosis of bronchial asthma should be reinvestigated with special consideration for all factors, including allergic, infectious, and psychosomatic. The skin tests should be repeated both by the scratch and by the intradermal methods, with care as regards the possibility of dermographia. Skin tests can only be done accurately in patients who have avoided antihistamines, epinephrine, and ephedrine or ephedrine-like compounds for at least one week, for these drugs definitely lessen size of skin tests. If the patient's asthma demands these drugs they should be temporarily replaced by sufficient dosages of corticotropin (ACTH) and/or cortisone, as these latter drugs do not interfere with the scratch and intradermal tests. Arsenic undoubtedly has a certain value in the treatment of bronchial asthma, but the drug's action is only temporary, and if taken over long periods of time arsenical preparations have led to severe complications, especially as regards the liver and the skin. In this patient any type of arsenic given by vein would be very hazardous, and even the oral method might be dangerous. If there is no improvement after the allergy survey has been

V 1
195

repeated, with or without hyposensitization, the patient should be given corticotropin (ACTH) and/or cortisone, with of course the necessary precautions and provided there are no contraindications.

In almost every asthmatic patient, relief occurs promptly if the patient is placed in a hospital room equipped with rubber bedding and all due precautions against inhalation of house dust. In the hospital the intravenous drip can be started, each liter of 5% glucose in water to contain 0.5 gm. of aminophylline with or without the addition of 20 units of corticotropin. About 5 to 6 liters are usually necessary over a period of about 48 hours. When the drip is discontinued, intramuscular injections of corticotropin are substituted in decreasing amounts, later to be replaced by the oral use of cortisone if asthma persists. This technique is usually very satisfactory.

DIFFERENTIAL DIAGNOSIS OF ABDOMINAL PAIN

To the Editor:—*What is the incidence of surgical disease in patients who have received average amounts of morphine, ¼ grain (15 mg.) given by hypodermic or the equivalent given intravenously, with little or no response, and who are found to suffer from a condition requiring surgical intervention? Specifying abdominal pains, I should like to exempt typical colicky pains as found in kidney stones, etc. Would the response to narcotics be of any value, e. g., to differentiate between a gallstone attack and a gallbladder empyema?*

M.D., New York.

Answer.—While it is true that severe intra-abdominal pain uninfluenced by ordinary doses of morphine may indicate the presence of a surgical lesion demanding operation, such as intestinal strangulation, this finding should not be accorded too much weight in the differential diagnosis, first, because there are so many conditions including intestinal strangulation that demand operation in which it does not occur, and, second, it may occur in conditions not requiring operation, as for example, tabetic crises and acute edematous pancreatitis. There has been no specific study of a large series of cases in which the relief of pain with morphine has been correlated with the final diagnosis. In general, however, such simple differential diagnostic factors are too frequently and erroneously used in arriving at a decision as to whether an abdominal operation is necessary or not. Such a decision should always depend on a careful consideration of the history and physical findings and the judgment, knowledge, and experience of the surgeon.

OSTEOGENESIS IMPERFECTA

To the Editor:—*An adopted daughter has osteogenesis imperfecta tarda. The genetic background is unknown. The child is 4 years old, and she has had three fractures involving only the right and left femurs. Factors causing these fractures were violent enough to probably fracture a normal femur and were of a twisting force variety. All fractures healed well, the last of these causing ½ in. shortening in the limb. The following questions are asked: 1. What is the prognosis, including a time interval, as to when the child's hormone factors will come into play in helping restore the calcium balance regarding her bone structure? 2. What hormonal therapy may be attempted now? What are the dangers to this therapy? 3. Is the vertebral column frequently involved in related injuries? 4. Will full, bilateral limb braces, such as those used in the follow-up cases of poliomyelitis, be of any help? Competent x-ray men were never able to detect anything wrong with the gross pictures. The blue scleras and repeated fractures, plus a biopsy of bone, confirmed this disorder. What is the best medical treatment available?* *M.D., South Dakota.*

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—1. Usually as the children reach adolescence the fractures tend not to occur or they become less frequent. 2. Apparently this is not due to hormonal disturbance but is a hereditary defect in the formation of the fibrous connective tissues and this includes the organic framework of the bone. 3. The vertebral column is rarely involved. 4. Limb braces tend to cause atrophy of the already weakened bones. The child should avoid injuries that tend to cause fractures; as she grows older she will learn to be more proficient in avoiding such injuries. It is better to let her develop as normally as possible and use her extremities as normally as possible and treat fractures as well as possible when, and if, they occur. She should get plenty of vitamins, milk, and vegetables in her diet. Apparently this is not a very severe case and it is possible that she will have no more fractures.

Answer.—Osteogenesis imperfecta in any of its three forms is not basically a disease of mineral metabolism. The fundamental fault is in the protein substance of the matrix, and, therefore, there will be no change in the calcium or phosphorus balance as time goes on. In this particular instance, the prognosis seems rather good. She has reached the age of 4, which most of these patients fail to do, and, in the course of this time, she has sustained only three fractures, which is also a good sign, particularly since it is mentioned that the violence each time was probably sufficient to fracture a normal femur. These patients seem to get better as they get older, and an improvement can be anticipated once she has reached adolescence. There is no therapy that has been found to be helpful, and it is inadvisable to experiment with hormones in a child of this age. The vertebral column may be involved, and scoliosis or an accentuated lordosis in the lumbar spine may develop. Full bilateral lower leg braces would undoubtedly hinder her and probably not afford sufficient protection to make them worth while. One patient now under observation for osteogenesis imperfecta tarda is 28 years old, and, aside from the lateral bowing of one femur and occasional discomfort in the knee together with an accentuated lumbar lordosis, she is doing well and is employed as a librarian.

EXPOSURE TO FLUORIDE DUST

To the Editor:—*A man was exposed to heavy concentration of fluoride dust while sifting fluoride before adding it to a hopper to be added to the city water supply. This exposure occurred in 1952 and gave him symptoms of hepatitis and pain in the liver region at the time. Following the exposure preventative and protective measures were instituted, but each summer during the heavier demands for water and when the air was dry his symptoms would recur. He has finally been removed from the job. X-rays of the bones are normal, and liver function studies are normal, but he continues to have vague symptoms of indigestion and pain in the liver region at times. X-rays of the gastrointestinal tract and gallbladder are normal. There was no previous history of hepatitic disorder. What are the possibilities of future liver disease, and how could one arrive at any idea of a permanency of injury for compensatory purposes?* *M.D., Idaho.*

Answer.—In true chronic fluoride poisoning the characteristic manifestation is increased density of bony and tendinous tissues as revealed by x-ray examination. This change ordinarily will not arise in the absence of prolonged, persistent exposure. In acute poisoning, whether by inhalation or ingestion of the fluoride, digestive disturbances often are prominent. Although not characteristic, pain in the liver region has been reported. Thus Roholm observes that about half of cryolite workers complained of lack of appetite, nausea, and shortness of breath and that a smaller proportion mentioned constipation, localized pain in the region of the liver, etc. Galeazzi, in 1948, reported a high frequency of liver damage in a region of endemic fluorosis. It would appear reasonable to believe that this patient may have suffered one or more acute episodes as noted in the query, but it may be unlikely that any present-day, vague symptoms of indigestion and pain in the liver region may represent a continuation of this disease to the present time. The absence of all bony changes as revealed by the x-ray supports this attitude. Should laboratory facilities be available for the study of enzymatic systems, some precise information might be gained through the measurement of the level of salivary amylase, peroxidase, cholinesterase, and urease. Many enzymes are known to be inhibited by fluorides.

USE OF RADIUM IN NASOPHARYNX

To the Editor:—*I would appreciate information on the use of radium (Crowe applicator) in the nasopharynx for destruction of lymphoid tissue. Is there any definite evidence that carcinoma can result as a late radiation sequel? Is x-ray treatment to be preferred?*

Bertram Capus, M.D., Oakland, Calif.

Answer.—This form of therapy is still very popular and is producing the desired results in the usual percentage of cases. So far there is no definite evidence to show that carcinoma can result as a late radiation sequel. Some reports show patients followed for as long as 30 years without serious pathological consequences. Due to the ease and simplicity of x-ray treatment in competent hands this type of therapy has increased in popularity at the expense of the radium applicator.

CHRONIC PANCREATITIS

To the Editor:—*Are there any laboratory tests to confirm a diagnosis of pancreatic calculi or chronic pancreatitis? A 49-year-old white woman complains of epigastric distress, fulness with small amount of food, bloating, belching, epigastric tenderness, constipation, and diarrhea. There has not been irregular jaundice or sugar in the urine. After eight days of no bowel movement, she suddenly had a huge stool that had the odor of fermented food. In the stool there was mucus and fine calculi. The size of the calculi was ¼ by ⅛ by ⅛ in. These appeared extruded from a duct. There were no ova, parasites, monilia, or blood present. Radiographic examinations revealed normal renal and psoas shadows. Fluoroscopy and films showed a normal esophagus, stomach, duodenum. There was a normal concentration of dye in the gallbladder without calculi. Response to fat meal was normal. Laboratory tests reveal normal agglutination tests. The Kahn test was normal; sedimentation rate 10 mm.; blood sugar level 86 mg. per 100 cc.; total cholesterol level 250 mg. per 100 cc.; serum amylase level 108 mg. per 100 cc.; erythrocytes 4,620,000 per cubic millimeter; leukocytes 5,100 per cubic millimeter; hemoglobin level 15.1 gm. per 100 cc.; and differential blood cell count 2 eosinophils, 70 segmented cells, and 28 lymphocytes. What treatment could be prescribed? If complaints continue would one be justified in recommending a laparotomy?*

Joseph V. Waitkunas, M.D., Woodhull, Ill.

Answer.—The above history and findings are strongly suggestive of chronic pancreatitis. The most positive means of diagnosing pancreatic calculi is by x-ray examination of the abdomen with centering over the pancreas. In about 10 to 20% of patients with chronic pancreatitis calculi will be present. Several laboratory tests help establish the diagnosis of chronic pancreatitis. The most frequently used test is determination of serum amylase, which should be over 300 mg. per 100 cc. on at least two different occasions in association with acute abdominal pain. The secretion test has proved useful in some cases. In about 97% of the patients with chronic pancreatitis the bicarbonate concentration is abnormal (decreased). Some patients with chronic pancreatitis develop diabetes, therefore a glucose-tolerance test is useful, or repeated daily urinalysis. The above patient at present should be further observed and treated conservatively. X-rays of the small intestine and colon should be obtained. If the complaints continue and all the above investigations prove normal, an exploratory laparotomy is justified.

ABDOMINAL SITUS INVERSUS

To the Editor:—*Why does the left testis normally hang lower than the right one, when the scrotum is relaxed? If the right testis hangs lower, is this in itself a reliable sign of abdominal situs inversus? How frequently does situs inversus occur in the abdominal cavity, the thoracic cavity, and both?*

M.D., Pennsylvania.

Answer.—Although it is common knowledge that the left testis is more dependent than the right when the scrotum is relaxed, a review of literature fails to reveal embryonic or anatomic factors to account for it nor how often the reverse position occurs. Reversal of the relative position is occasionally observed on clinical examination without apparent evidence of any other congenital defect. A review of the literature on situs inversus reveals only an occasional reference to the observation that a more dependent position of the right testis is indicative of the existence of situs inversus (Johnson, J. R.: *Arch. Surg.* **58:**149 [Feb.] 1949. Cholst, M. R.: *Am. J. Surg.* **73:**104 [Jan.] 1947). The incidence of situs inversus is variously given by statistics obtained by clinical, roentgenographic, and postmortem examination. Most articles refer to the incidence as about 1 out of 10,000 cases. Mayo and Rice (*Tr. West. S. A.* **56:**188, 1948) found a reported incidence in admissions to the Mayo Clinic during 1910-1947 of about 1 in 20,000. Blegen (*Ann. Surg.* **129:**244 [Feb.] 1949) quotes an incidence, as reported from mass surveys of the chest, of 1 in 6,581, and suggests that 1 in 6,000 to 8,000 is probably about right. He also found that of 144 patients with situs inversus, it was reported as total (abdominal and thoracic) in 125 and partial (abdominal or thoracic) in 19. One of the most complete references to the subject is made by a report of 1 million cases of serial roentgenograms made in Norway in which the incidence of thoracic situs inversus was found to be 0.011%.

MENTAL DEFICIENCY

To the Editor:—*A man and his wife are considering adopting the baby of a 26-year-old mentally incompetent white unmarried woman. They are anxious to know on a percentage basis what the chances are for the baby being normal mentally.*

M.D., Florida.

This inquiry was referred to two consultants whose respective replies follow.—Ed.

Answer.—Without knowing anything about the father and knowing nothing about the cause of mental deficiency in the mother, it is impossible to make an accurate statement about the chances of the child in question being normal. Some general statements have been made, however, by different workers on the percentage of defective children that have been produced when one parent is mentally defective. As a result of these studies Tage Kemp in his book, "Genetics and Disease" (Copenhagen, Denmark, Ejnar Munksgaards Forlag, 1951, p. 281) gives a figure of 30% defectives that might be of some value in this case.

Answer.—There are many causes of mental deficiency, and it is not possible to foretell inheritance on a percentage basis without knowing the cause in this specific instance. It should be definitely stated, however, that because this baby was born of a mating in which at least one of the persons was feeble-minded, the chances are much greater than average that the child will be mentally incompetent as well.

NASAL DISCHARGE WHEN LAUGHING

To the Editor:—*In* The Journal, *March 5, page 876, there was a query in regard to a woman who has a copious serous nasal discharge when "laughing or smiling broadly." The consultant felt that allergic rhinitis was most likely responsible. It would seem to me worth pointing out that a less frequent but more serious cause of such a phenomenon might be a communication between the subarachnoid space and the nasal cavity, resulting in cerebrospinal fluid rhinorrhea. I believe that laughing would increase intracranial pressure and consequently induce outpouring of fluid.*

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HERPES CAUSED BY SUNLIGHT

To the Editor:—*The answer to the question regarding herpes simplex following exposure to sunlight in Queries and Minor Notes, April 16, page 1458, requires some elaboration. I believe in this case porphyria should be considered as a very likely cause and the urine should be examined for porphyrins. If this diagnosis is made, then exposure to sunlight is interdicted.*

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195